CATALOG

PRIMARY SWITCH MODE POWER SUPPLIES

CP-C.1, CP-S.1, CP-S.3, CP-S.DC, CP-E, CP-D

- From economic to high-end
- A reliable solution for every application
- Worldwide approvals and support

ENGINEERED
TO OUTRUN



AVAILABLE IN DIFFERENT RANGES TO COVER EVERY APPLICATION REQUIREMENT, CP RANGE POWER SUPPLIES ARE USED TO EMPOWER YOUR VALUED ASSETS WORLDWIDE. THEIR EXCELLENT RELIABILITY IN DAILY USE HAS UNDER THE TOUGHEST OF CONDITIONS AND HARSHEST OF ENVIRONMENTS IS PROVEN.

CHOOSE ABB AS YOUR POWER SUPPLY PARTNER AND LEVERAGE OUR WIDE VARIETY OF PRODUCT OPTIONS. FROM ECONOMIC TO HIGH-END SOLUTIONS, THE CP RANGE OFFERS MAXIMUM VALUE.

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PRIMARY SWITCH MODE POWER SUPPLIES

Overview

Modern power supply units are a vital component in energy management and automation technology. As your global partner in these areas, ABB pays the utmost attention to the resulting requirements. Innovation is the key to ABB's power supply product program.

High segment universal power supply range, power reserve continuously, ATEX/ IECE, marine approval - Giving you the power to control



CP-C.1 Range
1-phase

High segment automation power supply range – up to 960 W, ompact design, power reserve, and marine approval



CP-S Range: CP-S.1, CP-S.3 & CP-S.DC
1-phase, 3-phase and DCDC converter

The power of choice
CP Range overview



CP-D Range
1-phase

Power supplies in modular DIN rail component housing with a height of 91mm (3.583 in)



CP-E Range
1-phase

High segment standard single and three-phase power supplies for your application with a perfect price/ performance ratio

PRIMARY SWITCH MODE POWER SUPPLIES

Overview

Power supplies for industrial applications



Universal Power Supplies
CP-C.1 range: high-performance range
The CP-C.1 power supplies are ABB's high-performance and most advanced range. With excellent efficiency, high reliability and innovative functionality, the CP-C.1 range is ready to take on the most demanding industrial applications. These power supplies have a 150 % integrated power reserve and operate at an efficiency of up to 94 %. They are equipped with overheat protection and active power factor correction. Combined with a broad AC and DC input range and extensive worldwide approvals, the CP-C.1 power supplies are the preferred choice for professional DC applications. Giving the power to control.



Automation Power Supplies
CP-S.1 range: high-efficiency range
The CP-S.1 power supplies offers high efficiency and reliability delivered in a compact footprint. Designed for a huge variety of applications, including machine building segments, this advanced range boosts an integrated 150 % power reserve for five seconds and operates at an efficiency of up to 94 %. With overheat protection, active power factor correction, a broad certified AC and DC input range and extensive worldwide approvals including marine, the all-new CP-S.1 power supplies are a preferred choice for multiple industrial applications.



CP-S.3 & CP-S.DC range
The 3-phase CP-S.3 power supply units and the high-voltage DCDC converter are characterized by high efficiency and reliability in a compact design. This innovative series was developed for a wide range of applications in addition to industrial automation, marine and offshore applications. It offers an integrated power reserve of 150 % for five seconds and operates with an efficiency of up to 94 %. With overheating protection, active power factor correction, a wide certified AC and DC input range and comprehensive worldwide approvals, including marine, the proven CP-S.1, the new CP-S.3 and CP-S.DC power supplies are a preferred choice for numerous industrial applications.

PRIMARY SWITCH MODE POWER SUPPLIES

Overview

Power supplies for industrial applications



Standard Power Supplies
CP-E range: economy range
The CP-E range offers enhanced functionality while the number of different types has been considerably reduced. Now all power supply units can be operated at an ambient temperature of up to +70 °C. The CP-E range 24 V devices over 18 W offer an output/contact for monitoring of the output voltage and remote diagnosis. Optimized for worldwide applications, the CP-E power supplies can be supplied within a wide range of AC or DC voltages. The output voltage is continuously adjustable, ensuring optimal adaptation to the application, e.g. compensating the voltage drop caused by a long line length. For decoupling of parallel connected power supplies below or equal to 56 V, redundancy modules are available in order to achieve true redundancy.



CP-B range: short time buffers
The CP-B range from ABB offers an innovative and completely maintenance-free product range designed to buffer the 24 V DC supply in the event of an interrupted mains on the primary side of the switch mode power supply. The range includes ultra-cap based buffer modules for short time UPS systems, with rated input voltage of 24 V DC and rated currents of 3 A, 10 A, and 20 A. The 10 A buffer module increased capacity to buffer up to 9 minutes (10% load). The range also features LEDs for status indication, signaling and status outputs, and offers higher than 90% efficiency. Buffering times at 100% load current range from 13 s to 50 s (depending on device).

Power supplies for building applications



CP-D range: distribution panel design
The CP-D range of power supply units in MDRC design (modular DIN rail components) fits into all domestic installation and distribution panels. With their width of only 18 to 90 mm, the CP-D range switch mode power supplies are ideally suited for installation in distribution panels. The range is optimized for worldwide applications and can be supplied with 90-264 V AC or 120-375 V DC. The continuously adjustable output voltage (CP-D > 10 W) ensures optimal adaption to the application, e.g. compensating the voltage drop caused by a long line length. An additional redundancy unit CP-D RU to establish true redundancy is available.

For certifications and approvals, please refer to the download section on the product web pages.

Primary switch mode power supplies

Selection table – Single-phase

		Order number	1SVR360563R1001	1SVR360663R1001	1SVR360763R1001	1SVR360563R2001	1SVR360663R2001	1SVR360763R2001	1SVR361563R1001	1SVR361663R1001	1SVR361763R1001	1SVR320361R1000	1SVR320561R1000	1SVR320661R1000	1SVR320761R1000	1SVR320861R1000	1SVR427033R3000	1SVR427032R1000	1SVR427035R1000	1SVR427030R0000	1SVR427031R0000	1SVR427032R0000	1SVR427034R0000	1SVR427035R0000	1SVR427036R0000	1SVR427030R2000	1SVR427031R2000	1SVR427034R0000	1SVR427035R2000	1SVR427041R1000	1SVR427043R1200	1SVR427041R0000	1SVR427043R0100	1SVR427044R0200	1SVR427045R0400
			Single-phase														Single-phase																		
			CP-C.1									CP-S.1					CP-E												CP-D						
Rated output voltage	5 V DC																■																		
	12 V DC																	■	■										■	■					
	24 V DC		■	■	■	■	■	■	■	■	■	■	■	■	■	■				■	■	■	■	■	■						■	■	■	■
	48 V DC																									■	■	■	■							
Rated output current	0.42 A																														■				
	0.625 A																									■									
	0.75 A																			■															
	0.83 A																												■						
	1.25 A																				■						■								
	1.3 A																															■			
	2.1 A																													■					
	2.5 A																	■				■											■		
	3 A											■					■																		
	4.2 A																																		■
	5 A		■			■			■				■										■					■							
	10 A			■			■			■				■					■					■					■						
	20 A				■			■			■				■										■										
	40 A															■																			
Rated output power	10 W																												■		■				
	15 W																■																		
	18 W																			■															
	25 W																													■					
	30 W																	■			■					■						■			
	60 W																					■					■							■	
	72 W											■																							
	100 W																																		■
	120 W		■			■			■				■						■				■						■						
	240 W			■			■			■				■											■				■						
	480 W				■			■			■				■											■				■					
	960 W															■																			
Rated input voltage	100-240 V AC		■	■	■	■	■	■	■	■	■	■	■	■	■		■	■		■	■	■				■	■		■	■	■	■	■	■
	110-240 V AC															■																			
	115/230 V AC auto select																		■				■	■				■							
	115-230 V AC																								■				■						
DC input voltage range	90-300 V DC		■	■	■	■	■	■	■	■	■																								
	90-375 V DC																	■			■	■				■	■								
	100-250 V DC											■	■	■	■																				
	110-250 V DC															■																			
	120-375 V DC																■			■					■				■	■	■	■	■	■	■
	210-375 V DC																		■				■	■				■							
Features	Power reserve design		■	■	■	■	■	■	■	■	■	■	■	■	■	■																			
	Adjustable output voltage		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■		■	■	■
	Integrated input fuse		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Short-circuit stable		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Fold-forward behavior (U/I)		■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■		■	■	■	■	■	■	■	■		■		■	■	■
	Fold-back behavior (hiccup)																■			■									■		■				
	Power factor correction		act	act	act	act	act	act	act	act	act	no	act	act	act	act			pas				pas	pas	act			pas	act						
	Signalling contact		■	■	■	■	■	■	■	■	■	■	■	■	■	■					■	■	■	■	■									
	Extended temp. range					■	■	■										■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Parallel connection		5	5	5	5	5	5	5	5	5	3	3	3	3	3	■	■	3	■	■	■	3	3	3	■	■	3	3						
	Serial connection		2	2	2	2	2	2	2	2	2	2	2	2	2	2	■	■	2	■	■	■	2	2	2	■	■	2	2	■	■	■	■	■	■
	Coated PCBA					■	■	■				■	■	■	■	■																			

pas = passive, act = active

Primary switch mode power supplies

Selection table – Three-phase & DC-DC Converter

		Order number	1SVR340567R1000	1SVR340667R1000	1SVR340767R1000	1SVR340867R1000	1SVR320766R1000
			CP-S.3				CP-S.DC
Rated output voltage	24 V DC		■	■	■	■	■
Rated output current	5 A		■				
	10 A			■			
	20 A				■		■
	40 A					■	
Rated output power	120 W		■				
	240 W			■			
	480 W				■		■
	960 W					■	
Rated input voltage	3~ 400 - 500 V AC		■	■	■	■	
DC input voltage range	420 - 870 V DC						■
Features	Power reserve design		■	■	■	■	■
	Adjustable output voltage		■	■	■	■	■
	Integrated input fuse		■	■	■	■	■
	Short-circuit stable		■	■	■	■	■
	Fold-forward behavior (U/I)		■	■	■	■	■
	Fold-back behavior (hiccup)						
	Power factor correction		act	act	act	act	
	Signalling contact		■	■	■	■	■
	Extended temp. range						
	Parallel connection		3	3	3	3	3
	Serial connection		2	2	2	2	2
	Coated PCBA		■	■	■	■	■

pas = passive, act = active

Primary switch mode power supplies

Certification and approvals

Mark		ABS	ATEX	cULus LISTED	cURus	CE	UKCA	DNV	RCM
Abbreviation		**ABS**	**ATEX**	**cULus**	**cURus**	**CE**	**UKCA**	**DNV**	**RCM**
Approved in		**US**		**North America**	**North America**	**Europe**	**UK**	**Norway**	**Australia New Zealand**
CP-E	CP-E 24/20.0 CP-E 48/10.0 CP-E 12/10.0 CP-E 48/5.0			■ E174460	■ E196145 E317914	■	■		■
	CP-E 5/3.0 CP-E 12/2.5 CP-E 24/2.5 CP-E 48/1.25 CP-E 24/1.25 CP-E 48/0.62 CP-E 24/0.75			■ E174460	■ E196145 E313203 E317914	■	■		■
	CP-E 24/5.0 CP-E 24/10.0			■ E174460	■ E196145 E317914	■	■		■
CP-D	CP-D 24/4.2			E174460	E196145	■	■		■
	CP-D 24/2.5 CP-D 12/2.1 CP-D 24/1.3 CP-D 12/0.83 CP-D 24/0.42 CP-D 24/1.3 CP-D 24/2.5			■ E174460	■ E196145 E313203	■	■		■
CP-D RU	CP-D RU					■	■		■
CP-B	CP-B 24/3.0 CP-B 24/10.0 CP-B 24/20.0			■ E174460		■	■		■
CP-C.1	CP-C.1 24/20.0-C CP-C.1 24/10.0-C CP-C.1 24/5.0-C	■	■	■ E174460	■ E196145 E317914	■	■		■
	CP-C.1-A-RU	■		■ E174460	■ E196145 E317914	■	■	■	■
	CP-C.1-A-RU-C	■	■	■ E174460	■ E196145 E317914	■	■	■	■
	CP-C.1-A-RU-L CP-C.1 24/5.0-L CP-C.1 24/10.0-L CP-C.1 24/20.0-L CP-C.1 24/5.0 CP-C.1 24/10.0 CP-C.1 24/20.0	■		■ E174460	■ E196145 E317914	■	■		■
CP-S.DC	CP-S.DC 24/20.0			■ E523399 E174460		■	■	■	■
CP-S.1	CP-S.1 24/40.0 CP-S.1 24/20.0 CP-S.1 24/10.0 CP-S.1 24/5.0 CP-S.1 24/3.0			■ E523399 E174460		■	■	■	■
CP-S.3	CP-S.3 24/20.0 CP-S.3 24/40.0 CP-S.3 24/10.0 CP-S.3 24/5.0			■ E523399 E174460		■	■	■	■







POWER SUPPLIES FOR INDUSTRIAL APPLICATIONS

013 – 033 **Universal Power Supplies Range**
CP-C.1 range

037 – 069 **Automation Power Supplies Range**
CP-S.1, CP-S.3 and CP-S.DC range

073 – 089 **Standard Power Supplies Range**
CP-E range


CP-C.1 24/5.0
CP-C.1 24/10.0
CP-C.1 24/20.0
CP-C.1-A-RU
OUTPUT 24 V DC 5 A
OUTPUT 24 V DC 10 A
OUTPUT 24 V DC 20 A
INPUT 100-240 V AC
OUTPUT OK
POWER RESERVE
OUTPUT
Adjust
22.5-28.5 V
INPUT 1
INPUT 2

UNIVERSAL POWER SUPPLIES RANGE CP-C.1 RANGE

014 – 015 **Benefits and advantages**

016 **Operating controls**

017 **Applications**

018 **Ordering details**

019 – 030 **Technical data**

031 – 033 **Technical diagrams**

CP-C.1 RANGE

Benefits and advantages

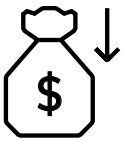


The high-performance CP-C.1 power supplies are ABB's most advanced range. With excellent efficiency, high reliability and innovative functionality, it is ready to take on the most demanding of industrial applications These power supplies have a 150 % integrated power reserve, operate at an efficiency of up to 94 % and are equipped with overheat protection and active power factor correction. Combined with a broad AC and DC input range and extensive worldwide approvals, including ATEX and IECEx approvals are available for the use in hazardous areas. CP-C.1 power supplies are the preferred choice for professional DC applications.



Continuous operation

- Power reserve design to allow performance with up to 150 % more current
- Redundancy setup of the application possible to allow parallel operation
- Long lifetime
- High peak currents for switching on capacitive loads are supported



Project cost reduction

- Up to 94 % efficiency saves money for energy during operation
- Less need for external cooling in the cabinet
- Small size to reduce space needed in panel



Reliabel in harsh conditions

- Extended ambient temperature range during operation -40...+70 °C with coated PCBA version
- IECEx/ATEX approvals for hazardous locations available
- High MTBF values

CP-C.1 RANGE

Benefits and advantages



Characteristics
- Rated output voltage 24 V DC
- Power reserve design delivers up to 150 % at Ta ≤ 40 °C
- Output voltage adjustable via front-facing rotary potentiometer “OUTPUT Adjust”, 22.5-28.5 V
- High efficiency of up to 94 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling)
- Devices with coated PCBAs for harsh environments and with extended temperature range
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- OUTPUT OK - signaling output “13-14” (relay), Power reserve signaling output “I > IR (transistor)
- Redundancy unit offers true redundancy, available as accessory
- Various approvals and marks



Main benefits
The primary switch mode power supply CP-C.1 has a wide range of certified AC and DC input voltages. Furthermore, the CP-C.1 is equipped with capacitors that ensure a hold-up time of at least 50 ms. This enables worldwide usage and permits safe operation in fluctuating networks and battery-powered applications.

With their robust metallic housing and the reliable construction, CP-C.1 power supplies are suitable for applications in industrial environments. The CP-C.1-C units have coated PCBAs, which enables their use in harsh industrial environments.

The power reserve of up to 150 % enables trouble-free starting of heavy loads eliminating the need for an oversized power supply.

Signaling output
To communicate the status of the power supply, the CP-C.1 is equipped with a relay output to signal OUTPUT OK as well as a transistor output I > I_R to indicate when the power reserve is active. These signals can be used for communication with a higher level control system, e.g. a PLC.

Depending on the logic of the higher level control system, an appropriate action is initiated by forwarding the signal. The receptor of this signal could be a contactor, a signal tower, or an interface relay.

CP-C.1 RANGE

Operating controls

13-14: Relay output
to signal ‘OUTPUT OK’

I > I_R:
Power reserve
transistor output
to signal ‘Power
reserve is active’

OUTPUT L+, L-:
Output terminals
24 V DC



Indication of operational states
OUTPUT OK:
Green LED
POWER RESERVE
I > I_R: Yellow LED

Side mounting screw holes
for DIN rail adapter /
lateral mounting

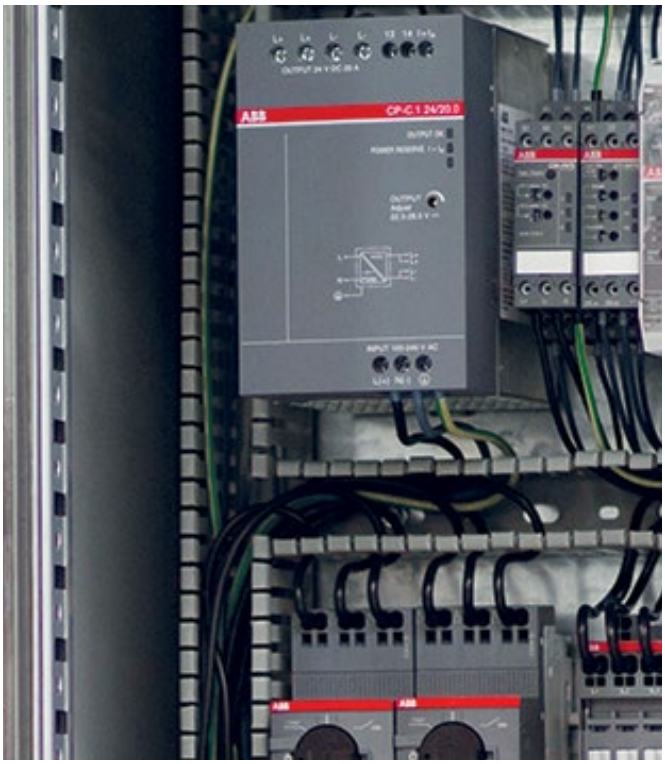
OUTPUT Adjust:
Rotary
potentiometer -
Adjustment of
output voltage
22.5-28.5 V DC

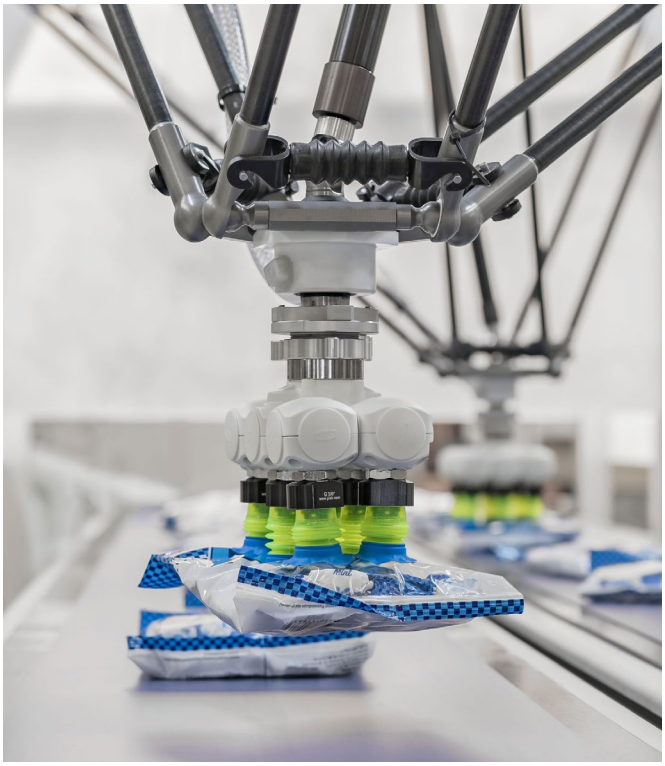
Circuit diagram

INPUT L(+), N(-), PE:
Input terminals
85-264 V AC /
90 - 300 V DC

CP-C.1 RANGE

Applications





Application
The primary switch mode power supply CP-C.1 has a wide range of AC and DC input voltages. Furthermore, the CP-C.1 is equipped with capacitors that ensure a hold-up time of at least 50 ms. This enables worldwide usage and permits safe operation in fluctuating networks and battery-powered applications. With their robust metallic housing and reliable construction, CP-C.1 power supplies are suitable for applications in industrial environments. The CP-C.1-C units have coated PCBAs, which enables their use in the harshest of industrial environments. The power reserve of up to 150 % enables trouble-free starting of heavy loads eliminating the need for an oversized power supply.

Adjustable output voltage
The CP-C.1 range power supplies feature a continuously adjustable output voltage of 22.5 to 28.5 V DC. Thus, they can be optimally adapted to the applications, e.g. compensating the voltage drop caused by a long line length.

Signaling output
To communicate the status of the power supply, the CP-C.1 is equipped with a relay output to signal OUTPUT OK as well as a transistor output $I > I_R$ to indicate when the power reserve is active. These signals can be used for communication with a higher level control system, e.g. a PLC.

Power reserve
The primary switch mode power supply CP-C.1 is equipped with a power reserve functionality to handle the start-up of particularly heavy loads (e.g. of a capacitive load or a motor). To ensure that heavy loads are started up, the CP-C.1 delivers additionally up to 150 % of the rated output current to secure the operation of the application. This status is displayed by the yellow LED labelled POWER RESERVE $I > I_R$.

CP-C.1 range
Ordering details



CP-C.1 24/5.0
CP-C.1 24/5.0-C



CP-C.1 24/10.0
CP-C.1 24/10.0-C



CP-C.1 24/20.0
CP-C.1 24/20.0-C



CP-C.1 24/5.0-L



CP-C.1 24/10.0-L

Description

The high-performance CP-C.1 power supplies are ABB's most advanced range. With excellent efficiency, high reliability and innovative functionality, it is ready to take on the most demanding of industrial applications These power supplies have a 150 % integrated power reserve, operate at an efficiency of up to 94 % and are equipped with overheat protection and active power factor correction. Combined with a broad AC and DC input range and extensive worldwide approvals, including ATEX and IECEx approvals are available for the use in hazardous areas. CP-C.1 power supplies are the preferred choice for professional DC applications.

ORDERING DETAILS - CP-C.1

Input voltage range	Rated output voltage / current	PCBA	Color	Type	Order code	Weight (1 pc.) kg (lb)
85-264 V AC, 90-300 V DC	24 V DC / 5 A	uncoated	dark grey	CP-C.1 24/5.0	1SVR360563R1001	0.87 (1.92)
	24 V DC / 10 A			CP-C.1 24/10.0	1SVR360663R1001	1.21 (2.67)
	24 V DC / 20 A			CP-C.1 24/20.0	1SVR360763R1001	1.70 (3.75)
	24 V DC / 5 A	coated		CP-C.1 24/5.0-C	1SVR360563R2001	0.87 (1.92)
	24 V DC / 10 A			CP-C.1 24/10.0-C	1SVR360663R2001	1.24 (2.73)
	24 V DC / 20 A			CP-C.1 24/20.0-C	1SVR360763R2001	1.72 (3.79)
	24 V DC / 5 A	uncoated	light grey	CP-C.1 24/5.0-L	1SVR361563R1001	0.87 (1.92)
	24 V DC / 10 A			CP-C.1 24/10.0-L	1SVR361663R1001	1.21 (2.67)
	24 V DC / 20 A			CP-C.1 24/20.0-L	1SVR361763R1001	1.70 (3.75)

CP-C.1 range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type			CP-C.1 24/5.0, CP-C.1 24/5.0-L	CP-C.1 24/5.0-C
Input circuit - Supply circuit				
				L (+), N (-)
Rated input voltage U_{in}				100-240 V AC, 100-270 V DC
Input voltage range				85-264 V AC, 90-300 V DC
Input current range at rated output power		100-240 V AC		0.6-1.4 A
		100-270 V DC		0.5-1.6 A
Typical input current		at 115 V AC		1.1 A
		at 230 V AC		0.6 A
Typical power consumption		at 230 V AC		132 W
Rated frequency				DC, 50/60 Hz
Frequency range		AC		45-65 Hz
Inrush current, cold state				< 8 A
Let-through energy I^2t , cold state		at 230 V AC		< 1 A^2s
Discharge current towards PE				< 3.5 mA
Hold-up time		at 115 V AC		min. 50 ms
		at 230 V AC		min. 50 ms
Internal input fuse				T4.0 A, not exchangeable
Recommended backup fuse for wire protection at 1.5 mm^2				1 pole miniature circuit breaker ABB type S 200 For USA/CAN: Use appropriate branch circuit 20 A fuse acc. regional and national regulations.
		characteristic		B or C
		max. rating		16 A
Power factor correction (PFC)				yes, active
Transient overvoltage protection				yes, varistor
User interface				
Indication of operational states				
Output voltage	LED 'OUTPUT OK ' (green)	ON		≥ 92 % of adjusted U_{out}
		flashing		< 90 % of adjusted U_{out}
Power reserve	LED 'I > I_R' (yellow)	OFF		I ≤ I_R
		ON		I > I_R
Output circuit - Power output				
				L+, L-
Rated output voltage			24 V DC	
Tolerance of the output voltage			± 1 %	
Adjustment range of the output voltage			22.5-28.5 V DC	
Rated output power			120 W	
Rated output current I_R		- 25 °C ≤ T_a ≤ 60 °C	5.0 A	-
		- 40 °C ≤ T_a ≤ 60 °C	—	5.0 A
Reserve output current		- 25 °C ≤ T_a ≤ 40 °C	7.5 A continuously	-
		- 40 °C ≤ T_a ≤ 40 °C	—	7.5 A continuously
Short-circuit current limiting				7.6 A
Derating of the output current		60 °C < T_a ≤ 70 °C		2.5 %/°C
Deviation width of output voltage		static output voltage deviaton 25-100 %		< 1 %
		dynamical 0-100 %		< 2 %
		change of input voltage within the rated input voltage		< 0.1 %
Recovery time T_A				< 1 ms
Starting time after applying the supply voltage				< 500 ms
Residual ripple and switching peaks		BW = 20 MHz		< 120 mV_{pp}, class A
Parallel connection				yes, up to 5 devices, to enable redundancy and to increase power, current not symmetrical
Series connection				yes, max. 2 devices to increase voltage

CP-C.1 range
Technical data

Type		CP-C.1 24/5.0, CP-C.1 24/5.0-L	CP-C.1 24/5.0-C
No-load, overload and short-circuit behavior			
Characteristic curve of output			U/I characteristic curve with power reserve
Short-circuit protection			continuous short-circuit stability
Short-circuit behavior			current limiting
Resistance to reverse feed			≤ 35 V DC
Overload protection			constant current limitation
Overtemperature protection			protection by switch off in case of overtemperature (thermal protection), automatic restart
No-load protection			continuous no-load stability
Starting of capacitive loads			yes
Signaling outputs			
OUTPUT OK signaling output			
Type of output	13-14		relay, n/o contact
ON (contact closed)			≥ 92 % of adjusted U_{out}
OFF (contact open)			< 90 % of adjusted U_{out}
Contact ratings	max. switching voltage / current		30 V AC - 0.5 A / 24 V DC - 1 A (resistive load)
	min. switching voltage / current		5 V DC / 1 mA
POWER RESERVE signaling output			
Type of output	$I > I_R$		transistor, short-circuit proof
Active / ON (closed)			$I > I_R$
Inactive / OFF (open)			$I \leq I_R$
Ratings	voltage / current		24 V DC / ≤ 20 mA
General data			
Efficiency	at rated output power		up to 93 %
Power loss	at rated output power		12 W
	at 50% of rated output power		8 W
	at no load		< 3.6 W
Duty time			100 %
MTBF	acc. to MIL 217 HDBK		on request
Dimensions			see “Dimensional drawings”
Material of housing	cover		zinc-coated sheet-steel
	housing shell		aluminium
	front		plastic, PA6, V-0
Mounting			DIN rail (IEC/EN 60715), snap-on mounting
Mounting position			see “Mounting positions” in the data sheet
Minimum distance to other units	horizontal		25 mm (0.98 in)
	vertical		25 mm (0.98 in)
Degree of protection (IEC/EN 60529)	housing / terminals		IP20 / IP20
Protection class (IEC/EN 61140)			I
Electrical connection			
Input circuits (L(+), N(-), PE)			
Connecting capacity	rigid		0.5-4.0 mm² (20-10 AWG)
	fine-strand with(out) wire end ferrule		0.5-2.5 mm² (20-12 AWG)
Stripping length			8 mm (0.315 in)
Tightening torque			0.5 Nm (4.4 lb.in)
Recommended screw driver			PH1 / Ø 4.0 x 0.8 mm
Output circuits (L+, L+, L-, L-)			
Connecting capacity	rigid		0.5-4.0 mm² (20-10 AWG)
	fine-strand with(out) wire end ferrule		0.5-2.5 mm² (20-12 AWG)
Stripping length			8 mm (0.315 in)
Tightening torque			0.5 Nm (4.4 lb.in)
Recommended screw driver			PH1 / Ø 4.0 x 0.8 mm

CP-C.1 range
Technical data

Type		CP-C.1 24/5.0, CP-C.1 24/5.0-L	CP-C.1 24/5.0-C
Signaling output (13-14, I > IR)			
Connecting capacity	rigid	0.5-4.0 mm² (20-10 AWG)	
	fine-strand with(out) wire end ferrule	0.5-2.5 mm² (20-12 AWG)	
Stripping length		8 mm (0.315 in)	
Tightening torque		0.5 Nm (4.4 lb.in)	
Recommended screw driver		PH1 / Ø 4.0 x 0.8 mm	
Maximum cable length (applicable for I>IR)		30 m	
Environmental data			
Ambient temperature range	operation	-25…+70 °C (-13... +158 °F)	-40…+70 °C (-40...+158 °F)
	rated output power	-25...+60 °C (-13... +140 °F)	-40...+60 °C (-40...+140 °F)
	storage	-40…+85 °C (-40...+185 °F)	
	transportation	-40…+85 °C (-40...+185 °F)	
Climatic class (IEC/EN 60721-3-1)	storage	1K2	
Climatic class (IEC/EN 60721-3-2)	transportation	2K2	
Climatic class (IEC/EN 60721-3-3)	operation	3K3	
Damp heat, cyclic (IEC/EN 60068-2-30)		test Db: 55 °C, 2 cycles	
Vibration (IEC/EN 60068-2-6)		test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis	
Shock, half-sine (IEC/EN 60068-2-27)		test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis	
Coated PCBA		no	yes
Gaseous corrosive environment withstand test (IEC/EN 60068-2-60)		—	testing method: 4 testing period: 21 days ambient conditions: 25 °C, 75 % r.h. air/volume change rate per hour: 3-6 sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3 IEC 60721-3.3 acc. 3C2/3C3 - H_2S ≥ 100 ± 10 ppb - SO_2/SO_3 ≥ 300 ± 20 ppb - Cl_2 ≥ 100 ± 10 ppb - NO_x ≥ 1250 ± 20 ppb

Isolation data		
Rated impulse withstand voltage U_{imp} (EN62477-1)	input circuit / output circuit	4 kV (1.2/50 µs)
	input circuit / PE	4 kV (1.2/50 µs)
	input circuit / relay contact	4 kV (1.2/50 µs)
	output circuit / relay contact	0.5 kV (1.2/50 µs)
	relay contact / PE	0.5 kV (1.2/50 µs)
	output circuit / PE	0.5 kV (1.2/50 µs)
System voltage (EN 62477-1)	input circuit / output circuit	300 V
	input circuit / PE	300 V
	input circuit / relay contact	300 V
	output circuit / relay contact	50 V
	relay contact / PE	50 V
	output circuit / PE	50 V
Overvoltage category (IEC/EN 62477-1)	< 2000 m	III
	2000…5000 m	II
Overvoltage category (IEC/EN 61010-1)	< 2000 m	II
Pollution degree		2
Protective separation (IEC/EN 61010-1 and 61010-2-201)	input circuit / output circuit	yes
	input circuit / relay contact	yes

CP-C.1 range
Technical data

Type		CP-C.1 24/5.0, CP-C.1 24/5.0-L	CP-C.1 24/5.0-C
Standards / Directives			
Standards		IEC/EN 61204	
Low Voltage Directive		2014/35/EU	
EMC Directive		2014/30/EU	
ATEX Directive		—	2014/34/EU
RoHS Directive		2011/65/EU	
Electrical safety		IEC/EN 61010-1 and IEC/EN 61010-2-201	
Process control equipment		UL 61010-1, UL 61010-2-201 / CAN/CSA C22.2 No. 61010-1-12, CAN/CSA-IEC 61010-2-201:18	
Protective extra low voltage		PELV (IEC/EN 61010-2-201)	
Safety extra low voltage		SELV (IEC/EN 61010-2-201)	
Limitation of harmonic line currents		IEC/EN 61000-3-2	
Electromagnetic compatibility			
Low-voltage power supplies, d.c. output – Part 3: Electromagnetic compatibility (EMC)		IEC/EN 61204-3	
Interference immunity to		IEC/EN 61000-6-2	
electrostatic discharge (ESD)	IEC/EN 61000-4-2	level 4, 8 kV / 15 kV (criterion A)	
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	level 3, 10 V/m (criterion A)	
electrical fast transient / burst	IEC/EN 61000-4-4	level 4, 4 kV / 2 kV (criterion A)	
surge	IEC/EN 61000-4-5	level 4, L/N 2 kV (criterion A) level 4, L,N/PE 4 kV (criterion A)	
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3, 10 V (criterion A)	
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	class 3	
harmonics and interharmonics	IEC/EN 61000-4-13	class 3 (criterion A)	
conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	IEC/EN 61000-4-16	level 3, 10 V	
Interference emission		IEC/EN 61000-6-3	
limits for harmonic current emissions	IEC/EN 61000-3-2	class A	
limitation of voltage changes etc.	IEC/EN 61000-3-3	compliant	
Electromagnetic compatibility of multimedia equipment - Emission requirements	IEC/CISPR 32, EN 55032	class B	
Industrial scientific and medical (ISM) radio-frequency equipment electromagnetic disturbance characteristics limits and methods of measurement	IEC/CISPR 11, EN 55011	class B	
Voltage sags	SEMI F47	passed	
Federal Communications Commission	FCC15	compliant	

CP-C.1 range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type			CP-C.1 24/10.0, CP-C.1 24/10.0-L	CP-C.1 24/10.0-C
Input circuit - Supply circuit				
				L (+), N (-)
Rated input voltage U_{in}				100-240 V AC, 100 - 270 V DC
Input voltage range				85-264 V AC, 90-300 V DC
Input current range and output power		100-240 V AC		1.2-2.7 A
		100-270 V DC		0.9-3.1 A
Typical input current		at 115 V AC		2.3 A
		at 230 V AC		1.2 A
Typical power consumption		at 230 V AC		256 W
Rated frequency				DC, 50/60 Hz
Frequency range		AC		45-65 Hz
Inrush current, cold state				< 11 A
Let-through energy I^2t , cold state		at 230 V AC		< 1,5 A^2s
Discharge current towards PE				< 3.5 mA
Hold-up time		at 115 V AC		min. 40 ms
		at 230 V AC		min. 40 ms
Internal input fuse				T6.3 A, not exchangeable
Recommended backup fuse for wire protection at 1.5 mm^2				1 pole miniature circuit breaker ABB type S 200 For USA/CAN: Use appropriate branch circuit 20 A fuse acc. regional and national regulations.
		characteristic		B or C
		max. rating		16 A
Power factor correction (PFC)				yes, active
Transient overvoltage protection				yes, varistor
User interface				
Indication of operational states				
Output voltage	LED 'OUTPUT OK ' (green)	ON		≥ 92 % of adjusted U_{out}
		flashing		< 90 % of adjusted U_{out}
Power reserve	LED 'I > I_R' (yellow)	OFF		I ≤ I_R
		ON		I > I_R
Output circuit - Power output				
				L+, L-
Rated output voltage				24 V DC
Tolerance of the output voltage				±1 %
Adjustment range of the output voltage				22.5-28.5 V DC
Rated output power				240 W
Rated output current I_R		- 25 °C ≤ T_a ≤ 60 °C	10.0 A	-
		- 40 °C ≤ T_a ≤ 60 °C	—	10.0 A
Reserve output current		- 25 °C ≤ T_a ≤ 40 °C	15.0 A continuously	-
		- 40 °C ≤ T_a ≤ 60 °C	—	15.0 A continuously
Short-circuit current limiting			15.5 A	15.5 A
Derating of the output current		60 °C < T_a ≤ 70 °C	2.5 %/°C	2.5 %/°C
Deviation width of output voltage		static output voltage deviation 25-100 %		< 1%
		dynamic 0-100 %		< 5 %
		change of input voltage within the rated input voltage		< 0.1 %
Recovery time T_A				< 1 ms
Starting time after applying the supply voltage				< 500 ms
Residual ripple and switching peaks		BW = 20 MHz		< 120 mV_{pp}, class A
Parallel connection				yes, up to 5 devices, to enable redundancy and to increase power, current not symmetrical
Series connection				yes, max. 2 devices to increase voltage

CP-C.1 range
Technical data

Type		CP-C.1 24/10.0, CP-C.1 24/10.0-L	CP-C.1 24/10.0-C
No-load, overload and short-circuit behavior			
Characteristic curve of output			U/I characteristic curve with power reserve
Short-circuit protection			continuous short-circuit stability
Short-circuit behavior			current limiting
Resistance to reverse feed			≤ 35 V DC
Overload protection			constant current limitation
Overtemperature protection			protection by switch off in case of overtemperature (thermal protection), automatic restart
No-load protection			continuous no-load stability
Starting of capacitive loads			yes
Signaling outputs			
OUTPUT OK signaling output			
Type of output	13-14		relay, n/o contact
ON (contact closed)			≥ 92 % of adjusted U_{out}
OFF (contact open)			< 90 % of adjusted U_{out}
Contact ratings	max. switching voltage / current		30 V AC - 0.5 A / 24 V DC - 1 A (resistive load)
	min. switching voltage / current		5 V DC / 1 mA
POWER RESERVE signaling output			
Type of output	$I > I_R$		transistor, short-circuit proof
Active / ON (closed)			$I > I_R$
Inactive / OFF (open)			$I \leq I_R$
Ratings	voltage/current		24 V DC / ≤ 20 mA
General data			
Efficiency	at rated output power		up to 94 %
Power loss	at rated output power		16 W
	at 50% of rated output power		12 W
	at no load		< 3.6 W
Duty cycle			100 %
MTBF	acc. to MIL 217 HDBK		on request
Dimensions			see “Dimensional drawings”
Material of housing	cover		zinc-coated sheet-steel
	housing shell		aluminium
	front		plastic, PA6, V-0
Mounting			DIN rail (IEC/EN 60715), snap-on mounting
Mounting position			see “Mounting positions” in the data sheet
Minimum distance to other units	horizontal		25 mm (0.98 in)
	vertical		25 mm (0.98 in)
Degree of protection (IEC/EN 60529)	housing / terminals		IP20 / IP20
Protection class (IEC/EN 61140)			I
Electrical connection			
Input circuits (L(+), N(-), PE)			
Connecting capacity	rigid		0.5-4.0 mm² (20-10 AWG)
	fine-strand with(out) wire end ferrule		0.5-2.5 mm² (20-12 AWG)
Stripping length			8 mm (0.315 in)
Tightening torque			0.5 Nm (4.4 lb.in)
Recommended screw driver			PH1 / Ø 4.0 x 0.8 mm
Output circuits (L+, L+, L-, L-)			
Connecting capacity	rigid		0.5-4.0 mm² (20-10 AWG)
	fine-strand with(out) wire end ferrule		0.5-2.5 mm² (20-12 AWG)
Stripping length			8 mm (0.315 in)
Tightening torque			0.5 Nm (4.4 lb.in)
Recommended screw driver			PH1 / Ø 4.0 x 0.8 mm

CP-C.1 range
Technical data

Type		CP-C.1 24/10.0, CP-C.1 24/10.0-L	CP-C.1 24/10.0-C
Signaling output (13-14, I > IR)			
Connecting capacity	rigid	0.5-4.0 mm² (20-10 AWG)	
	fine-strand with(out) wire end ferrule	0.5-2.5 mm² (20-12 AWG)	
Stripping length		8 mm (0.315 in)	
Tightening torque		0.5 Nm (4.4 lb.in)	
Recommended screw driver		PH1 / Ø 4.0 x 0.8 mm	
Maximum cable length (applicable for $I>I_R$)		30 m	
Environmental data			
Ambient temperature range	operation	-25…+70 °C (-13...+158 °F)	-40…+70 °C (-40...+158 °F)
	rated output power	-25...+60 °C (-13...+140 °F)	-40...+60 °C (-40...+140 °F)
	storage	-40…+85 °C (-40...+185 °F)	
	transportation	-40…+85 °C (-40...+185 °F)	
Climatic class (IEC/EN 60721-3-1)	storage	1K2	
Climatic class (IEC/EN 60721-3-2)	transportation	2K2	
Climatic class (IEC/EN 60721-3-3)	operation	3K3	
Damp heat, cyclic (IEC/EN 60068-2-30)		test Db: 55 °C, 2 cycles	
Vibration (IEC/EN 60068-2-6)		test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis	
Shock, half-sine (IEC/EN 60068-2-27)		test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis	
Coated PCBA		no	yes
Gaseous corrosive environment withstand test (IEC/EN 60068-2-60)		—	testing method: 4 testing period: 21 days ambient conditions: 25 °C, 75 % r.h. air/volume change rate per hour: 3-6 sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3 IEC 60721-3.3 acc. 3C2/3C3 - H_2S ≥ 100 ± 10 ppb - SO_2/SO_3 ≥ 300 ± 20 ppb - Cl_2 ≥ 100 ± 10 ppb - NO_x ≥ 1250 ± 20 ppb

Isolation data		
Rated impulse withstand voltage U_{imp} (EN62477-1)	input circuit / output circuit	4 kV (1.2/50 µs)
	input circuit / PE	4 kV (1.2/50 µs)
	input circuit / relay contact	4 kV (1.2/50 µs)
	output circuit / relay contact	0.5 kV (1.2/50 µs)
	relay contact / PE	0.5 kV (1.2/50 µs)
	output circuit / PE	0.5 kV (1.2/50 µs)
System voltage (EN62477-1)	input circuit / output circuit	300 V
	input circuit / PE	300 V
	input circuit / relay contact	300 V
	output circuit / relay contact	50 V
	relay contact / PE	50 V
	output circuit / PE	50 V
Overvoltage category (IEC/EN62477-1)	< 2000 m	III
	2000…5000 m	II
Overvoltage category (IEC/EN61010-1)	< 2000 m	II
Pollution degree		2
Protective separation (IEC/EN 61010-1 and IEC/EN 61010-2-201)	input circuit / output circuit	yes
	input circuit / relay contact	yes

CP-C.1 range
Technical data

Type		CP-C.1 24/10.0, CP-C.1 24/10.0-L	CP-C.1 24/10.0-C
Standards / Directives			
Standards		IEC/EN 61204	
Low Voltage Directive		2014/35/EU	
EMC Directive		2014/30/EU	
ATEX Directive		—	2014/34/EU
RoHS Directive		2011/65/EU	
Electrical safety		IEC/EN 61010-1 and IEC/EN 61010-2-201	
Process control equipment		UL 61010-1, UL 61010-2-201 / CAN/CSA C22.2 No. 61010-1-12, CAN/CSA-IEC 61010-2-201:18	
Protective extra low voltage		PELV (IEC/EN61010-2-201)	
Safety extra low voltage		SELV (IEC/EN 61010-2-201)	
Limitation of harmonic line currents		IEC/EN 61000-3-2	
Electromagnetic compatibility			
Low-voltage power supplies, d.c. output – Part 3: Electromagnetic compatibility (EMC)		IEC/EN 61204-3	
Interference immunity to		IEC/EN 61000-6-2	
electrostatic discharge (ESD)	IEC/EN 61000-4-2	level 4, 8 kV / 15 kV (criterion A)	
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	level 3, 10 V/m (criterion A)	
electrical fast transient / burst	IEC/EN 61000-4-4	level 4, 4 kV / 2 kV (criterion A)	
surge	IEC/EN 61000-4-5	level 4, L/N 2 kV (criterion A) level 4, L,N/PE 4 kV (criterion A)	
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3, 10 V (criterion A)	
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	class 3	
harmonics and interharmonics	IEC/EN 61000-4-13	class 3 (Criterion A)	
conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	IEC/EN 61000-4-16	level 3, 10 V	
Interference emission		IEC/EN 61000-6-3	
limits for harmonic current emissions	IEC/EN 61000-3-2	class A	
limitation of voltage changes etc.	IEC/EN 61000-3-3	compliant	
Electromagnetic compatibility of multimedia equipment - Emission requirements	IEC/CISPR 32, EN 55032	class B	
Industrial scientific and medical (ISM) radio-frequency equipment electromagnetic disturbance characteristics limits and methods of measurement	IEC/CISPR 11, EN 55011	class B	
Voltage sags	SEMI F47	passed	
Federal Communications Commission	FCC15	compliant	

CP-C.1 range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type			CP-C.1 24/20.0, CP-C.1 24/20.0-L	CP-C.1 24/20.0-C
Input circuit - Supply circuit				
				L (+), N (-)
Rated input voltage U_{in}				100-240 V AC, 100-270 V DC
Input voltage range				85-264 V AC, 90-300 V DC
Input current voltage and rated output power		100-240 V AC		2.3-5.3 A
		100-270 V DC		1.5-5.9 A
Typical input current		at 115 V AC		4.6 A
		at 230 V AC		2.3 A
Typical power consumption		at 230 V AC		508 W
Rated frequency				DC, 50/60 Hz
Frequency range		AC		45-65 Hz
Inrush current, cold state				< 11 A
Let-through energy I^2t , cold state		at 230 V AC		< 3 A^2s
Discharge current towards PE				< 3.5 mA
Hold-up time		at 115 V AC		min. 40 ms
		at 230 V AC		min. 40 ms
Internal input fuse				T12 A, not exchangeable
Recommended backup fuse for wire protection at 1.5 mm^2				1 pole miniature circuit breaker ABB type S 200 For USA/CAN: Use appropriate branch circuit 20 A fuse acc. regional and national regulations.
		characteristic		B or C
		max. rating		16 A
Power factor correction (PFC)				yes, active
Transient overvoltage protection				yes, varistor
User interface				
Indication of operational states				
Output voltage	LED 'OUTPUT OK ' (green)	ON		≥ 92 % of adjusted U_{out}
		flashing		< 90 % of adjusted U_{out}
Power reserve	LED 'I > I_R' (yellow)	OFF		I ≤ I_R
		ON		I > I_R
Output circuit - Power output				
				L+, L-
Rated output voltage				24 V DC
Tolerance of the output voltage				± 1 %
Adjustment range of the output voltage				22.5-28.5 V DC
Rated output power				480 W
Rated output current I_R		- 25 °C ≤ T_a ≤ 60 °C	20 A	-
		- 40 °C ≤ T_a ≤ 60 °C	—	20 A
Reserve output current		- 25 °C ≤ T_a ≤ 40 °C	26.0 A continuously	-
		- 40 °C ≤ T_a ≤ 60 °C	—	26.0 A continuously
Short-circuit current limiting				27.7 A
Derating of the output current		60 °C < T_a ≤ 70 °C		2.5 %/°C
Deviation width of output voltage	static output voltage deviaton 25-100 %			< 1 %
		dynamical 0-100 %		< 5 %
		change of input voltage within the rated input voltage		< 0.1 %
Recovery time T_A				< 1 ms
Starting time after applying the supply voltage				< 500 ms
Residual ripple and switching peaks		BW = 20 MHz		< 120 mV_{pp}, class A
Parallel connection				yes, up to 5 devices, to enable redundancy and to increase power, current not symmetrical
Series connection				yes, max. 2 devices to increase voltage

CP-C.1 range
Technical data

Type		CP-C.1 24/20.0, CP-C.1 24/20.0-L	CP-C.1 24/20.0-C
No-load, overload and short-circuit behavior			
Characteristic curve of output		U/I characteristic curve with power reserve	
Short-circuit protection		continuous short-circuit stability	
Short-circuit behavior		current limiting	
Resistance to reverse feed		≤ 35 V DC	
Overload protection		constant current limitation	
Overtemperature protection		protection by switch off in case of overtemperature (thermal protection), automatic restart	
No-load protection		continuous no-load stability	
Starting of capacitive loads		yes	
Signaling outputs			
OUTPUT OK signaling output			
Type of output	13-14	relay, n/o contact	
ON (contact closed)		≥ 92 % of adjusted U_{out}	
OFF (contact open)		< 90 % of adjusted U_{out}	
Contact ratings	max. switching voltage / current	30 V AC - 0.5 A / 24 V DC - 1 A (resistive load)	
	min. switching voltage / current	5 V DC / 1 mA	
POWER RESERVE signaling output			
Type of output	$I > I_R$	transistor, short-circuit proof	
Active / ON (closed)		$I > I_R$	
Inactive / OFF (open)		$I \leq I_R$	
Ratings	voltage/current	24 V DC / ≤ 20 mA	
General data			
Efficiency	at rated output power	up to 94 %	
Power loss	at rated output power	28 W	
	at 50 % of rated output power	17 W	
	at no load	< 3.6 W	
Duty cycle		100 %	
MTBF	acc. to MIL 217 HDBK	on request	
Dimensions		see “Dimensional drawings”	
Material of housing	cover	zinc-coated sheet-steel	
	housing shell	aluminium	
	front	plastic, PA6, V-0	
Mounting		DIN rail (IEC/EN 60715), snap-on mounting	
Mounting position		see “Mounting positions” in the data sheet	
Minimum distance to other units	horizontal	25 mm (0.98 in)	
	vertical	25 mm (0.98 in)	
Degree of protection (IEC/EN 60529)	housing / terminals	IP20 / IP20	
Protection class (IEC/EN 61140)		I	
Electrical connection			
Input circuits (L(+), N(-), PE)			
Connecting capacity	rigid	0.5-4.0 mm² (20-10 AWG)	
	fine-strand with(out) wire end ferrule	0.5-2.5 mm² (20-12 AWG)	
Stripping length		8 mm (0.315 in)	
Tightening torque		0.5 Nm (4.4 lb.in)	
Recommended screw driver		PH1 / Ø 4.0 x 0.8 mm	

CP-C.1 range
Technical data

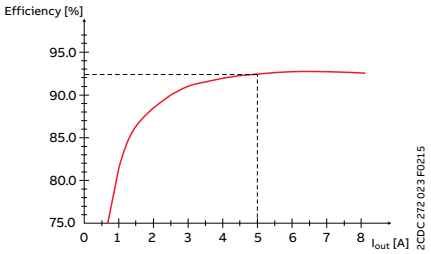
Type		CP-C.1 24/20.0, CP-C.1 24/20.0-L	CP-C.1 24/20.0-C
Output circuits (L+, L+, L-, L-)			
Connecting capacity	rigid		2.5-16.0 mm² (12-6 AWG)
	fine-strand with(out) wire end ferrule		2.5-10 mm² (12-8 AWG)
Stripping length			10 mm (0.394 in)
Tightening torque			1.2 Nm (10.5 lb-in)
Recommended screw driver			PH1 / Ø 4.0 x 0.8 mm
Signaling output (13-14, I > IR)			
Connecting capacity	rigid		0.5-4.0 mm² (20-10 AWG)
	fine-strand with(out) wire end ferrule		0.5-2.5 mm² (20-12 AWG)
Stripping length			8 mm (0.315 in)
Tightening torque			0.5 Nm (4.4 lb.in)
Recommended screw driver			PH1 / Ø 4.0 x 0.8 mm
Maximum cable length (applicable for $I>I_R$)			30 m
Environmental data			
Ambient temperature range	operation	-25…+70 °C (-13…+158 °F)	-40…+70 °C (-40…+158 °F)
	rated output power	-25…+60 °C (-13…+140 °F)	-40…+60 °C (-40…+140 °F)
	storage		-40…+85 °C (-40…+185 °F)
	transportation		-40…+85 °C (-40…+185 °F)
Climatic class (IEC/EN 60721-3-1)	storage		1K2
Climatic class (IEC/EN 60721-3-2)	transportation		2K2
Climatic class (IEC/EN 60721-3-3)	operation		3K3
Damp heat, cyclic (IEC/EN 60068-2-30)			test Db: 55 °C, 2 cycles
Vibration (IEC/EN 60068-2-6)			test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis
Shock, half-sine (IEC/EN 60068-2-27)			test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis
Coated PCBA		no	yes
Gaseous corrosive environment withstand test (IEC/EN 60068-2-60)		—	testing method: 4 testing period: 21 days ambient conditions: 25 °C, 75 % r.h. air/volume change rate per hour: 3-6 sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3 IEC 60721-3.3 acc. 3C2/3C3 - H_2S ≥ 100 ± 10 ppb - SO_2/SO_3 ≥ 300 ± 20 ppb - Cl_2 ≥ 100 ± 10 ppb - NO_x ≥ 1250 ± 20 ppb

CP-C.1 range
Technical data

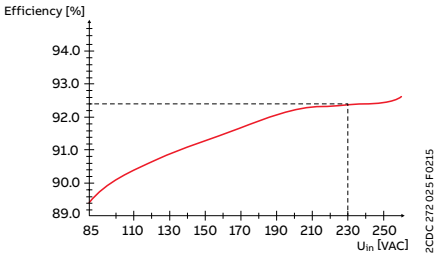
Type		CP-C.1 24/20.0, CP-C.1 24/20.0-L	CP-C.1 24/20.0-C
Isolation data			
Rated impulse withstand voltage U_{imp} (EN62477-1)	input circuit / output circuit	4 kV (1.2/50 µs)	
	input circuit / PE	4 kV (1.2/50 µs)	
	input circuit / relay contact	4 kV (1.2/50 µs)	
	output circuit / relay contact	0.5 kV (1.2/50 µs)	
	relay contact / PE	0.5 kV (1.2/50 µs)	
	output circuit / PE	0.5 kV (1.2/50 µs)	
System voltage (EN62477-1)	input circuit / output circuit	300 V	
	input circuit / PE	300 V	
	input circuit / relay contact	300 V	
	output circuit / relay contact	50 V	
	relay contact / PE	50 V	
	output circuit / PE	50 V	
Overvoltage category (EN62477-1)	< 2000 m	III	
	2000…5000 m	II	
Overvoltage category (IEC/EN61010-1)	< 2000 m	II	
Pollution degree		2	
Protective separation (IEC/EN61010-1 and IEC/EN61010-2-201)	input circuit / output circuit	yes	
	input circuit / relay contact	yes	
Standards / Directives			
Standards		IEC/EN 61204	
Low Voltage Directive		2014/35/EU	
EMC Directive		2014/30/EU	
ATEX Directive		—	2014/34/EU
RoHS Directive		2011/65/EU	
Electrical safety		IEC / EN 61010-1 and IEC / EN 61010-2-201	
Process control equipment		UL 61010-1, UL 61010-2-201 / CAN/CSA C22.2 No. 61010-1-12, CAN/CSA-IEC 61010-2-201:18	
Protective extra low voltage		PELV (IEC/EN 61010-2-201)	
Safety extra low voltage		SELV (IEC/EN 61010-2-201)	
Limitation of harmonic line currents		IEC/EN 61000-3-2	
Electromagnetic compatibility			
Low-voltage power supplies, d.c. output – Part 3: Electromagnetic compatibility (EMC)		IEC/EN 61204-3	
Interference immunity to		IEC/EN 61000-6-2	
electrostatic discharge (ESD)	IEC/EN 61000-4-2	level 4, 8 kV / 15 kV (criterion A)	
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	level 3, 10 V/m (criterion A)	
electrical fast transient / burst	IEC/EN 61000-4-4	level 4, 4 kV / 2 kV (criterion A)	
surge	IEC/EN 61000-4-5	level 4, L/N 2 kV (criterion A) level 4, L,N/PE 4 kV (criterion A)	
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3, 10 V (criterion A)	
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	class 3	
harmonics and interharmonics	IEC/EN 61000-4-13	class 3 (Criterion A)	
conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	IEC/EN 61000-4-16	level 3, 10 V	
Interference emission		IEC/EN 61000-6-3	
limits for harmonic current emissions	IEC/EN 61000-3-2	class A	
limitation of voltage changes etc.	IEC/EN 61000-3-3	compliant	
Electromagnetic compatibility of multimedia equipment - Emission requirements	IEC/CISPR 32, EN 55032	class B	
Industrial scientific and medical (ISM) radio-frequency equipment electromagnetic disturbance characteristics limits and methods of measurement	IEC/CISPR 11, EN 55011	class B	
Voltage sags	SEMI F47	passed	
Federal Communications Commission	FCC15	compliant	

CP-C.1 range
Technical diagrams

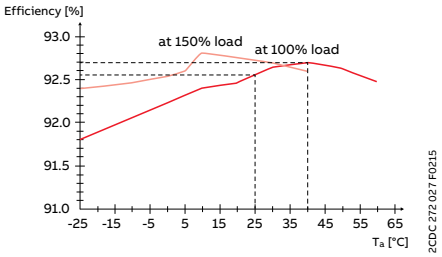
CP-C.1 24/5.0 , CP-C.1 24/5.0-L AND CP-C.1 24/5.0-C



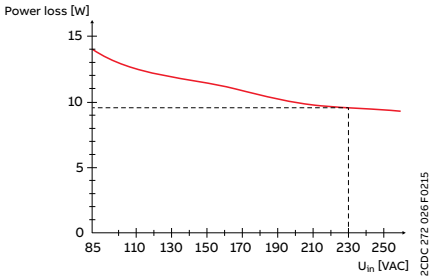
Typical efficiency over output current



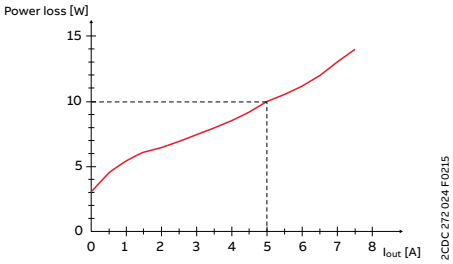
Typical efficiency over AC input voltage



Typical efficiency over ambient temperature

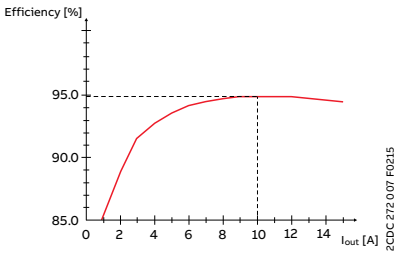


Typical power loss over AC input voltage

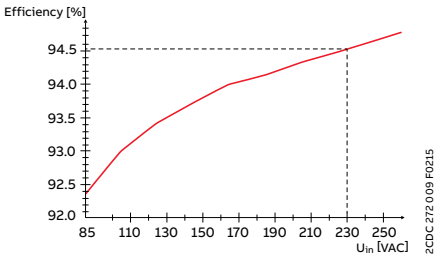


Typical power loss over output current

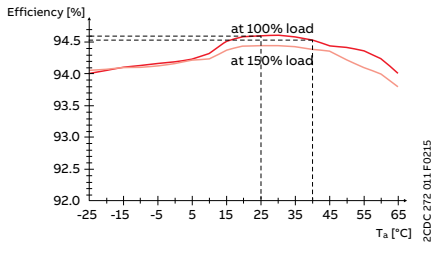
CP-C.1 24/10.0, CP-C.1 24/10.0 -L AND CP-C.1 24/10.0-C



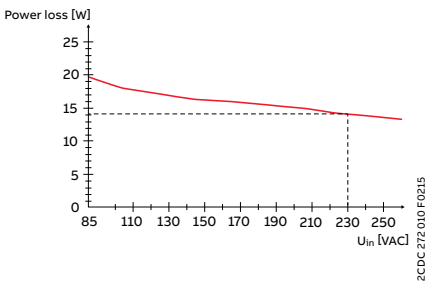
Typical efficiency over output current



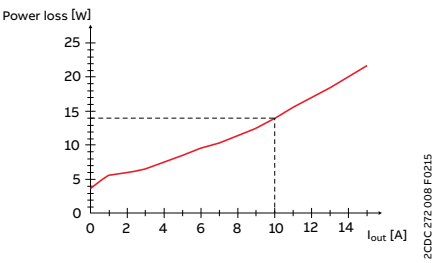
Typical efficiency over AC input voltage



Typical efficiency over ambient temperature



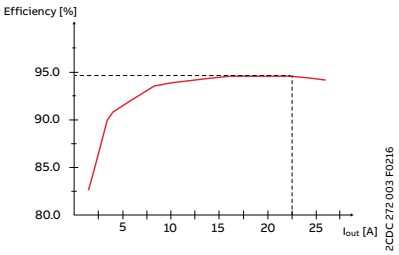
Typical power loss over AC input voltage



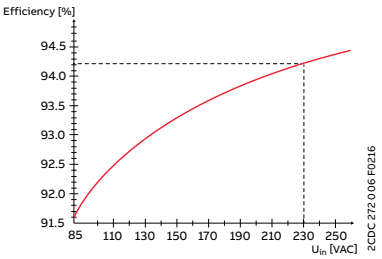
Typical power loss over output current

CP-C.1 range
Technical diagrams

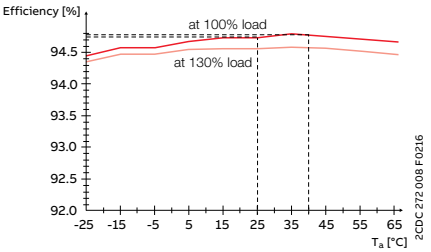
CP-C.1 24/20.0, CP-C.1 24/20.0-L AND CP-C.1 24/20.0-C



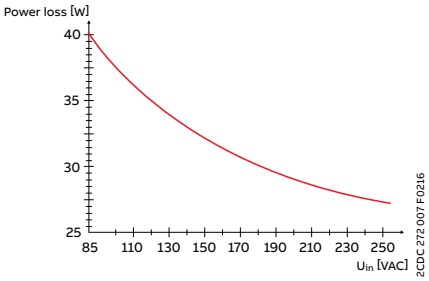
Typical efficiency over output current



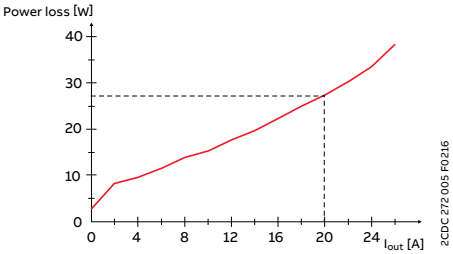
Typical efficiency over AC input voltage



Typical efficiency over ambient temperature



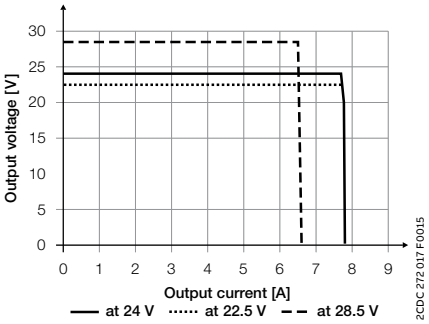
Typical power loss over AC input voltage



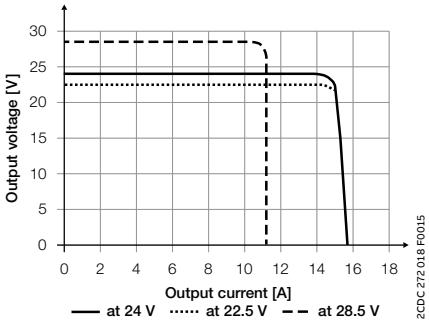
Typical power loss over output current

CP-C.1 range
Technical diagrams

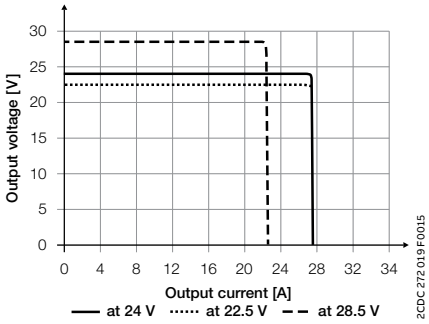
CHARACTERISTIC CURVE OF OUTPUT AT T_A = 25 °C



CP-C.1 24/5.0, CP-C.1 24/5.0-L
CP-C.1 24/5.0-C

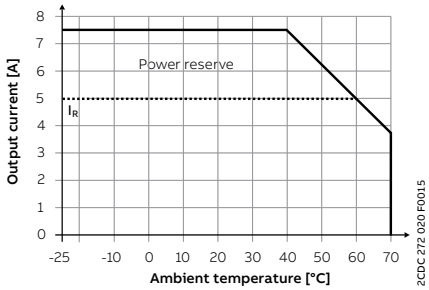


CP-C.1 24/10.0, CP-C.1 24/10.0-L
CP-C.1 24/10.0-C

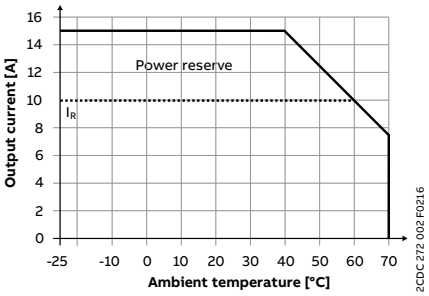


CP-C.1 24/20.0, CP-C.1 24/20.0-L
CP-C.1 24/20.0-C

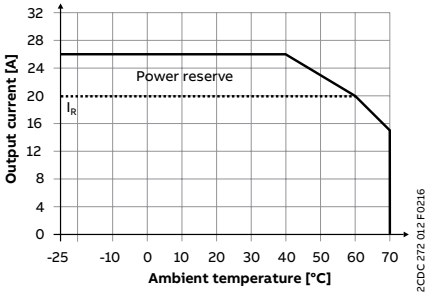
CHARACTERISTIC CURVE OF TEMPERATURE AT U_{OUT} = 24 V



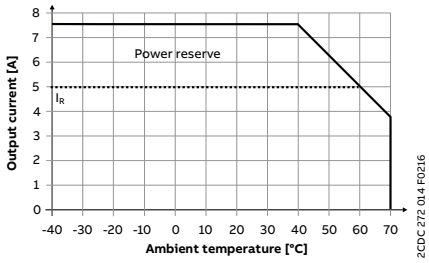
CP-C.1 24/5.0, CP-C.1 24/5.0-L



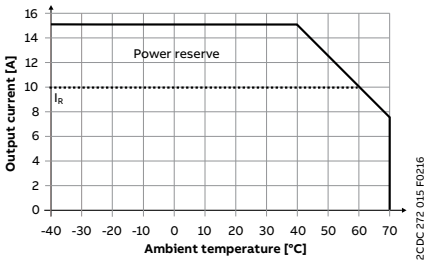
CP-C.1 24/10.0, CP-C.1 24/10.0-L



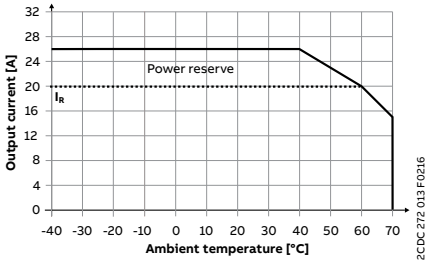
CP-C.1 24/20.0, CP-C.1 24/20.0-L



CP-C.1 24/5.0-C



CP-C.1 24/10.0-C

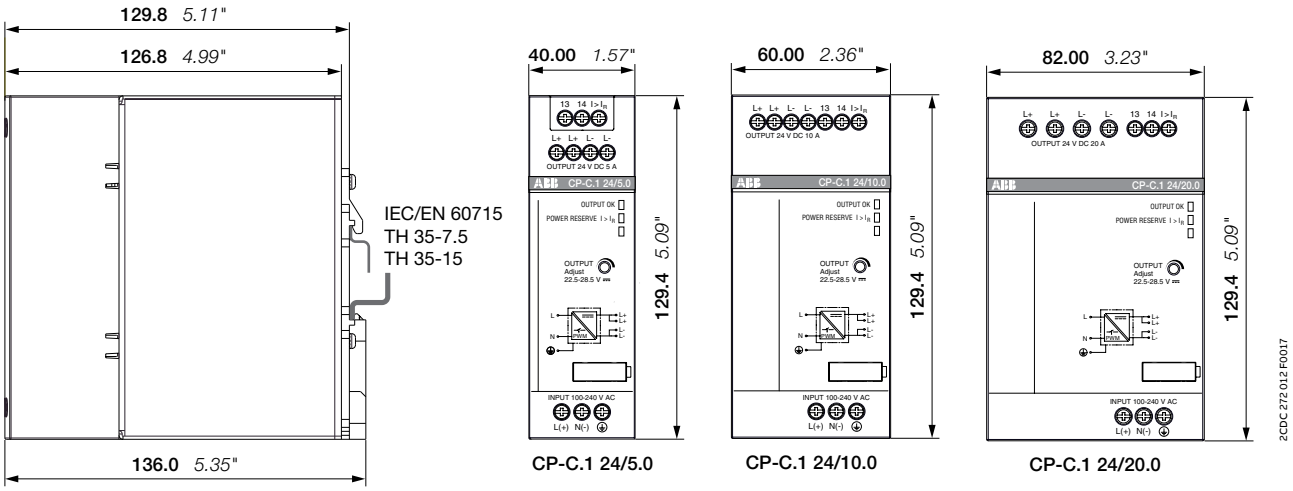


CP-C.1 24/20.0-C

CP-C.1 range
Technical diagrams

DIMENSIONAL DRAWINGS

Dimensions in **mm** and inches



CP-C.1 24/5.0

CP-C.1 24/5.0 -C
CP-C.1 24/5.0 -L

CP-C.1 24/10.0

CP-C.1 24/10.0 -C
CP-C.1 24/10.0 -L

CP-C.1 24/20.0

CP-C.1 24/20.0 -C
CP-C.1 24/20.0 -L





AUTOMATION POWER SUPPLIES RANGE CP-S.1, CP-S.3 AND CP-S.DC RANGE

038 – 040 **Benefits and advantages**

041 – 042 **Operating controls**

044 **Characteristics and applications**

047 **Application examples CP-S.1, Food & Beverage**

049 **Application example CP-S.3 DC Charger (EV fast charger)**

051 **Application example CP-S.DC intermediate DC bus**

052 **Application example CP-S DC DC Industries**

054 **Description**

055 **Ordering details**

056 – 066 **Technical data**

068 – 071 **Technical diagrams**

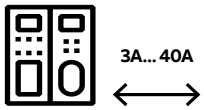
CP-S.1, CP-S.3 & CP-S.DC POWER SUPPLIES

High efficiency and reliability in a compact design

The CP-S.1, the 3-phase CP-S.3 power supply units and the high-voltage DCDC converter are characterized by high efficiency and reliability in a compact design. This innovative series was developed for a wide range of applications in addition to industrial automation, marine and offshore applications. It offers an integrated power reserve of 150 % for five seconds and operates with an efficiency of up to 94 %. With overheating protection, active power factor correction, a wide certified AC and DC input range and comprehensive worldwide approvals, including marine, the proven CP-S.1, the new CP-S.3 and CP-S.DC power supplies are a preferred choice for numerous industrial applications.



High Input Voltage DCDC Converter
A complete 24 V DC offering with 20A/480W power output in metal enclosure, contributes to growing Higher DC voltage application requirement.



Complete offering for Three-Phase power supplies
A complete 24 V DC range, consisting of the CP-S.1 with 3 A to 40 A, the CP-S.3 with 5 A to 40 A and the CP-S.DC with 20 A, perfectly meets all OEM requirements. The robust metal housing meets the high demands of industrial applications and guarantees a long service life of the devices.

HIGH EFFICIENCY UP TO 94%



01
The CP-S power supply range is designed for use in demanding industrial applications



02 CP-S range

Global availability
The CP-S range can be used in multiple installations in the world. A certified wide AC and DC input voltage range as well as a variety of approvals incl. marine, giving you the confidence of world-wide sourcing – no matter where you build, install or operate your equipment.

Increased reliability
Metal housing, coated PCBA and marine certification enable CP-s.1, CP-S.3 & CP-S.DC power supplies being the perfect match for e.g. Wind, Solar, Marine applications.

Small footprint
CP-S.1, CP-S.3 & CP-S.DC power supplies can save the control cabinet's valuable installation space due to their compact design and high efficiency.

In comparison to other power supply ranges on the market, ABB's CP-S range achieves space savings up to 50 %. Together with the high-efficiency and reduced power losses features, CP-S devices are a space and cost saving solution for applications where size matters.

Compatible with other ABB products
True redundancy could be achieved by using the optional redundancy unit CP-C.1-A-RU. CP-B buffer modules helps to ensure a short-term uninterruptible power supply with a voltage of 24 V DC, as they buffer the load in the event of a power failure.

Cost reduction
The space-saving design of the CP-S.1, CP-S.3 and CP-S.DC allows the user to equip the switchgear in an optimized way. Together with the increased energy efficiency of the devices, this significantly reduces running costs.

Low heat
The low requirement for external cooling and affection to other devices in the same cabinet

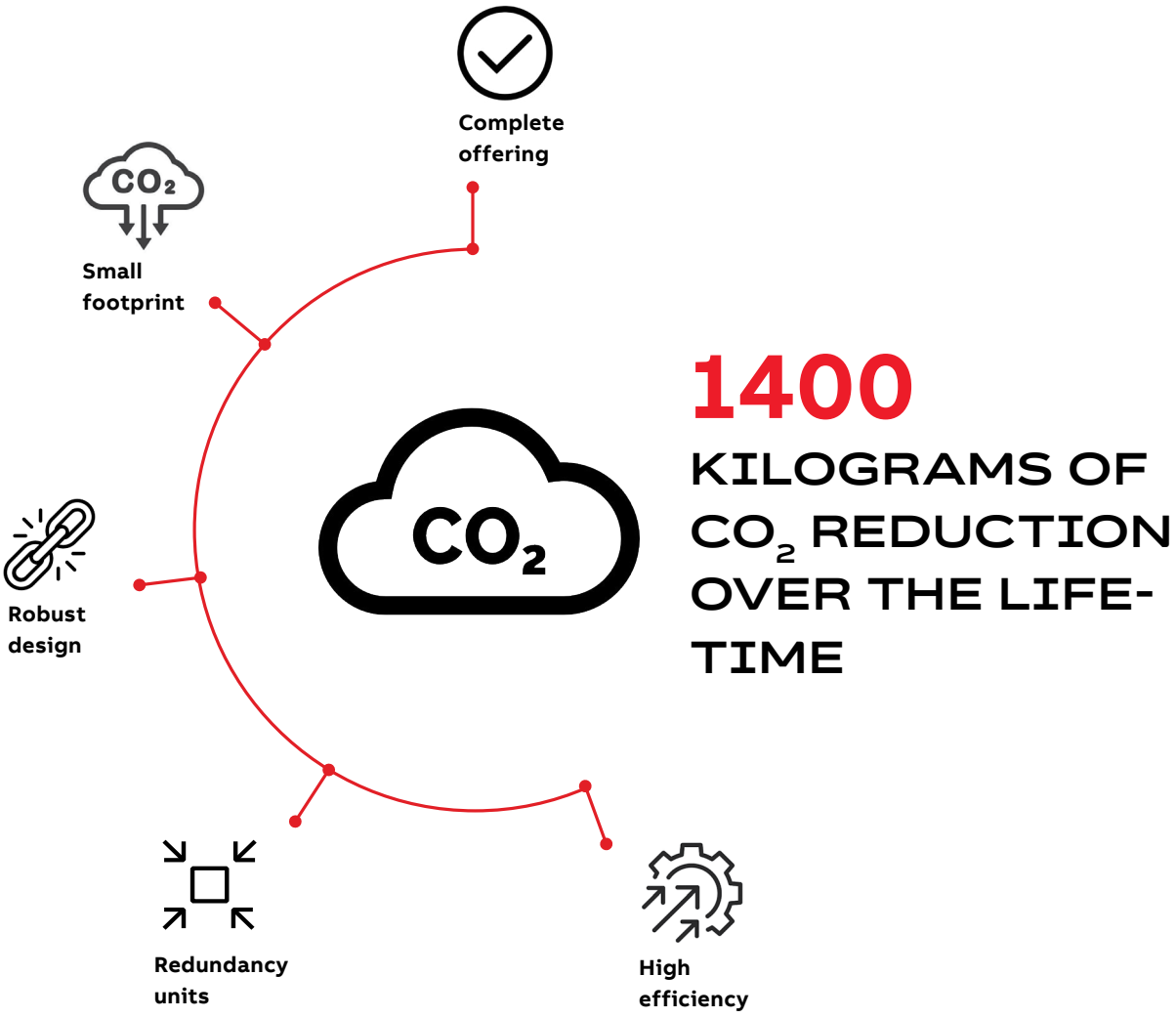
CP-S.1, CP-S.3 & CP-S.DC POWER SUPPLIES

Sustainability through remarkable CO_2 reduction

CP-S.1, CP-S.3 & CP-S-DC power supply units are a sustainable investment as they are characterized by an astonishing efficiency of up to 94%. An increase in efficiency of just 2% means a saving of 1.4 tons of CO_2 over a service life of ten years. This corresponds to the annual CO_2 compensation by around 60 trees.

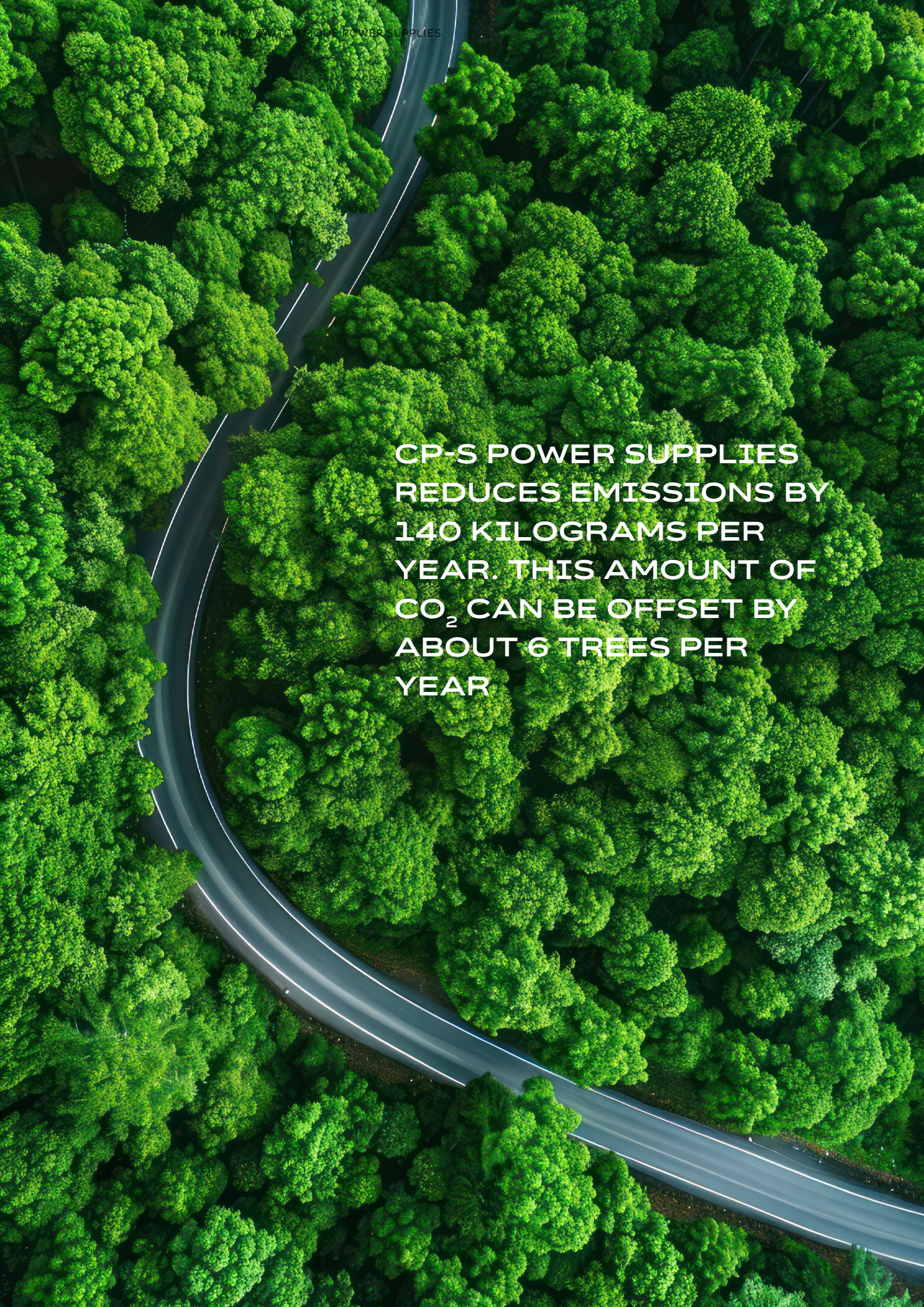
With a wide AC and DC voltage input range, they are built for versatility and ideal for a broad range of industrial applications, including renewable energy systems, marine equipment, industrial automation, and electric vehicle charging stations.

Designed to meet the needs of original machine builders across multiple industries, they offer dependable performance in various segments.



1400

KILOGRAMS OF CO_2 REDUCTION OVER THE LIFE-TIME



CP-S POWER SUPPLIES REDUCES EMISSIONS BY 140 KILOGRAMS PER YEAR. THIS AMOUNT OF CO_2 CAN BE OFFSET BY ABOUT 6 TREES PER YEAR

CP-S.1, CP-S.3 & CP-S.DC POWER SUPPLIES

Operating controls

The design of the CP-S range housing impresses with its structured and clear arrangement and the wide range of application options.

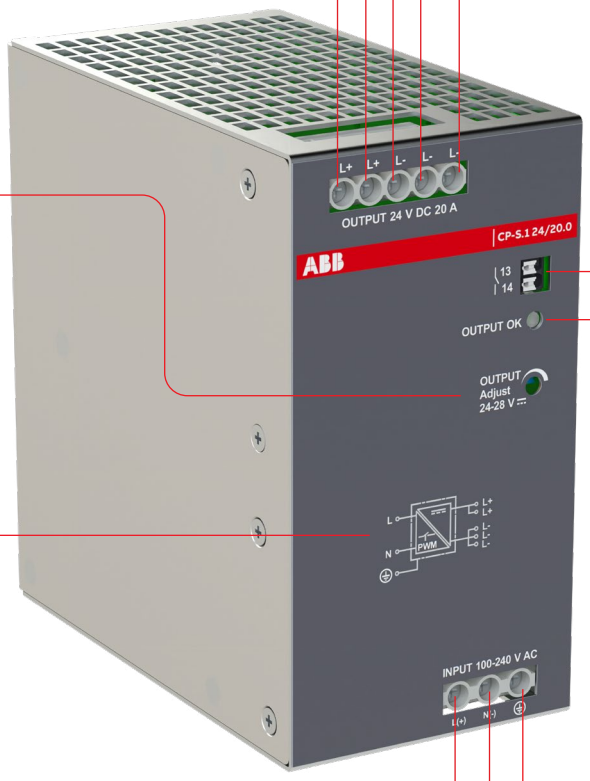
The robust design enables use in difficult conditions and the technical specifications ensure robust performance wherever power is needed.



OUTPUT L+, L-:
Output terminals
2x L+ and 2x L-
24 V DC

OUTPUT Adjust:
Rotary potentiometer
- Adjustment of output voltage 24-28 V DC

Circuit diagram



Additional L(-)
Ex. Grounding
For 10A, 20A and 40A

13-14: Relay output
Relay output to signal 'OUTPUT OK'

OUTPUT OK: green LED for indication of 24 V DC
- On: output voltage >92% of adjusted voltage
- Flashes: output voltage <90% of adjusted voltage

INPUT Terminals:
CP-S.3: L1, L2, L3, PE
CP-S.1: L(+), N(-), PE
CP-S.DC: +, -, PE



01



02



03



04

CP-S.1, CP-S.3 & CP-S.DC POWER SUPPLIES

Characteristics and applications

Features	CP-S.1	CP-S.3	CP-S.DC
Application	High-performance for automation & OEMs, industrial use		Machine building, industrial, wider DC needs
Approvals	Marine, global AC-certified		Marine, global DC-certified
Input Voltage	85 - 264 V AC / 90 - 277 V DC	3~ 320 - 575 V AC	420 - 870 V DC
Output Voltage	24 V DC (adjustable 24 - 28 V DC)		
Output Current Options	3 A, 5 A, 10 A, 20 A, 40 A	5 A, 10 A, 20 A, 40 A	20 A
Rated Power	72 W, 120 W, 240 W, 480 W, 960 W	120 W, 240 W, 480 W, 960 W	480 W
Efficiency	Up to 94%		
Power Reserve	150% I_N for up to 5s		
Operating Temp.	-25°C to +70°C		
Space optimization	Up to 50% size reduction		Maximim space savings
Sustainability impact	2% efficiency increase reduces CO_2 emission		Higher efficiency increase reduces CO_2 emission
Design & Protection	Coated PCBA, compact metal housing		
Additional Features	'L-' Terminal for grounding (10, 20, 40A)		'L-' Terminal for grounding
Output Monitoring	'OUTPUT OK' relay output (24 V DC, 1 A, LED)		
Power Management	Active Power Factor Correction, Parallel (max 3 units) & Series connection (2 units)		Parallel (max 3 units) & Series connection (2 units)
Compatibility	Works with ABB CP-C.1-A-RU, CP-B and EPD 24 modules		
Global Certifications	CB, CE, UKCA, cULus, DNV, RCM		

All three ranges CP-S.1, CP-S.3 and CP-S.DC deliver high efficiency, space savings, and system reliability, but the choice depends on your input voltage needs:

CP-S.1 / CP-S.3: Optimized for AC-powered applications.
CP-S.DC: Designed for DC-powered industrial environments.



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CP-S.1 range , CP-S.3 range and CP-S.DC



THANKS TO THEIR SMALL FOOTPRINT AND HIGH EFFICIENCY, CP-S POWER SUPPLIES ARE VERSATILE AND WITH THEIR WIDE APPLICATION RANGE, THEY CAN BE FOUND EVERYWHERE, INCLUDING THE ONES LISTED ABOVE.

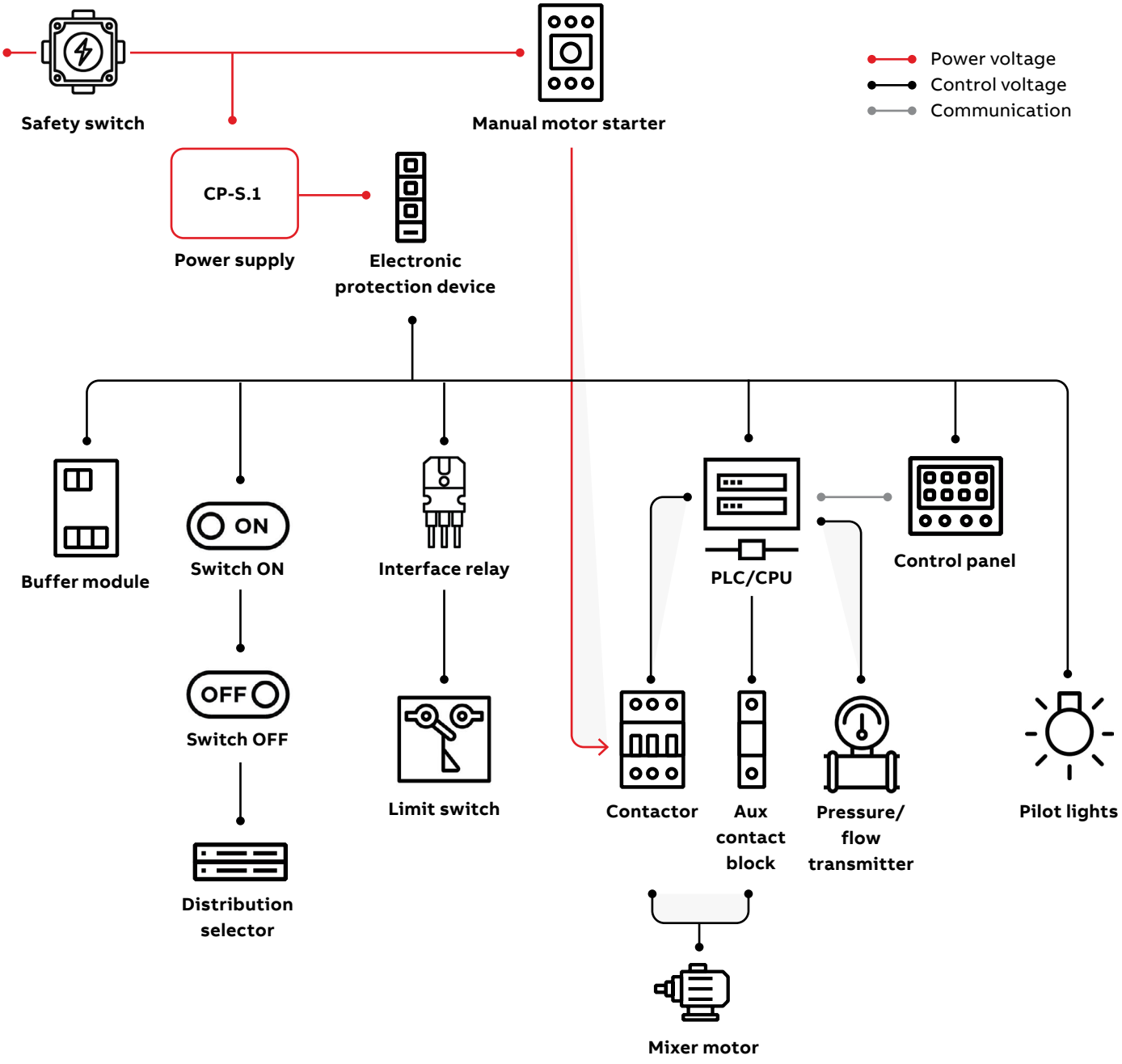


CP-S.1 POWER SUPPLIES

Application example, e.g. Food & Beverage

The term mixer refers to containers which are filled with liquids and/or solids and then rotate to mix the contents. Mixers are used extensively not only in the food and beverage sector but also in many other applications like chemicals and road construction.

In many mixers, heating and/or cooling may also be required. Subjected to application requirements, mixer control systems are working independently or connected to PLCs/DCS. Safety and F&B standards are very important for mixers.



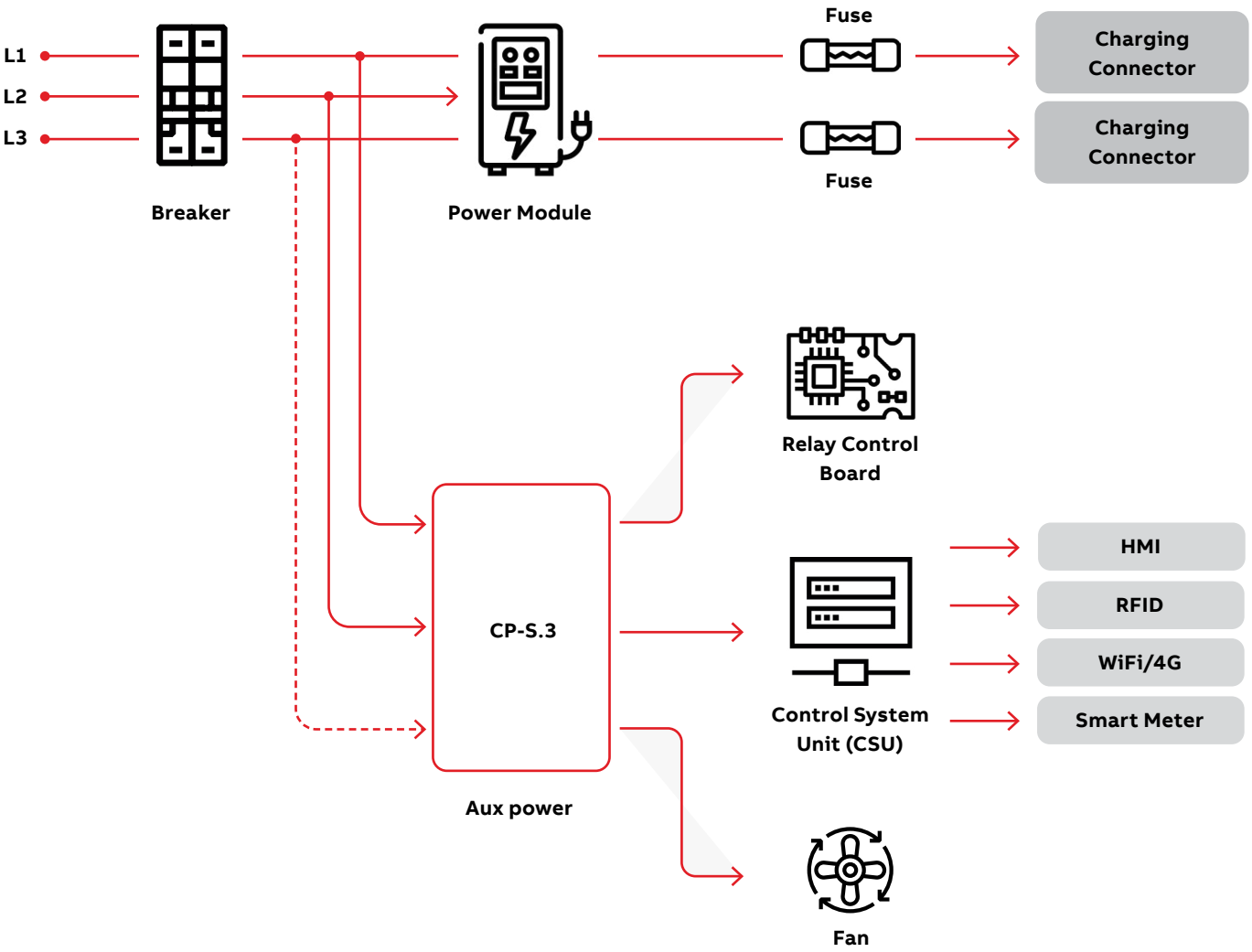


CP-S.3 POWER SUPPLIES

Application example, e.g. DC Charger (EV fast charger)

Discover the power of efficient and reliable charging solutions with ABB's DIN rail mounted AC to DC power supplies, designed for electric vehicle (EV) charging stations.

Our advanced power supplies convert AC mains power into the reliable 24 V DC voltage, ensuring seamless auxiliary power for a wide range of electric vehicles applications. With compact designs, high efficiency,reliable operation and robust safety features, ABB's power supplies not only enhance the performance of charging stations but also support auxiliary systems such as communication interfaces and control units. As the demand for electric vehicles continues to grow, our solutions provide the scalability and reliability needed to power the future of sustainable transportation.



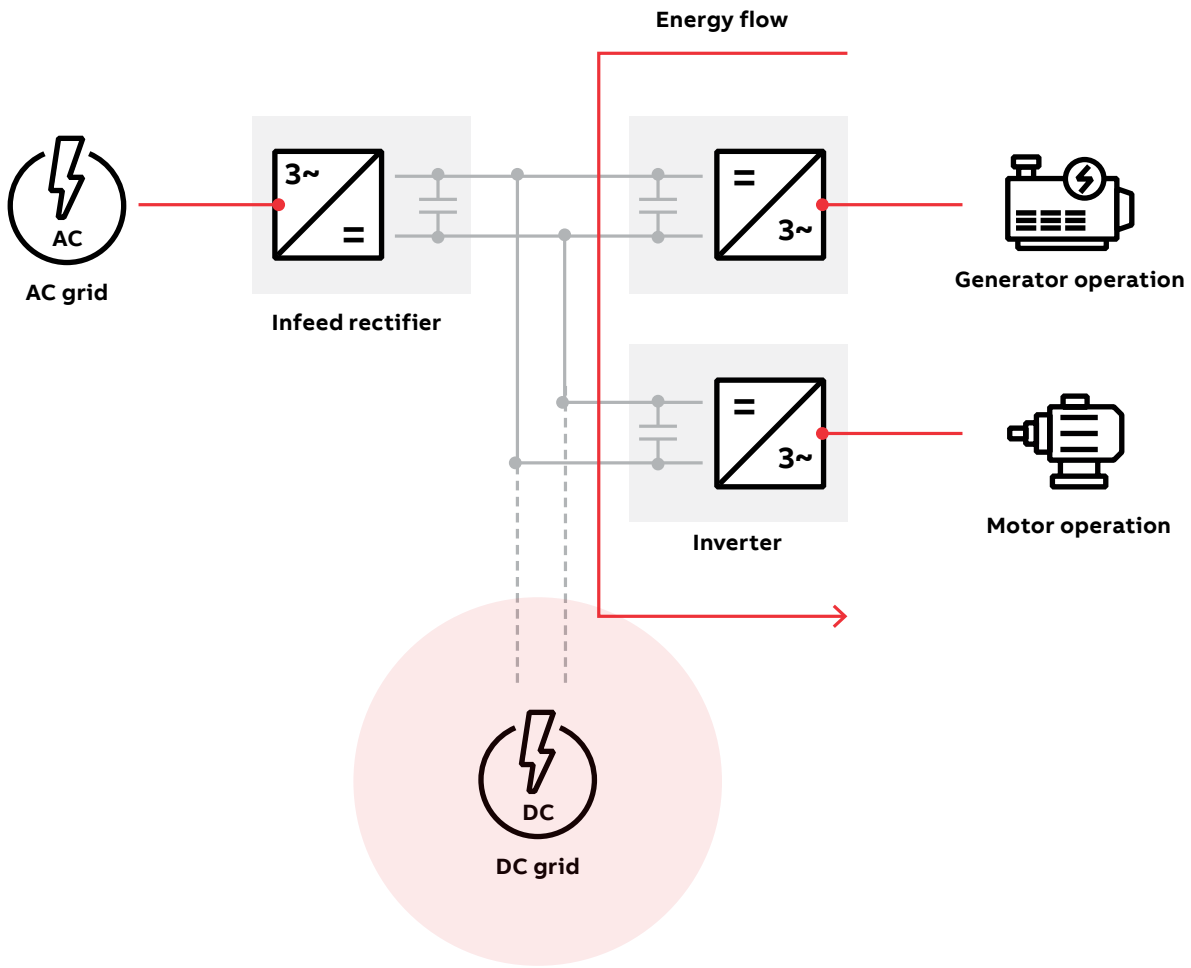


CP-S.DC POWER SUPPLIES

Application example, e.g. intermediate DC bus

The CP-S.DC power supply (DC/DC convertere) connects directly to the intremediate DC bus, using stored motor energy during mains failure until the motor stops.

Built for high EMI noise, it features a robust input stage and integrated filter. UL-approved with 600 V DC-rated input fuses, it ensures reliable performance.

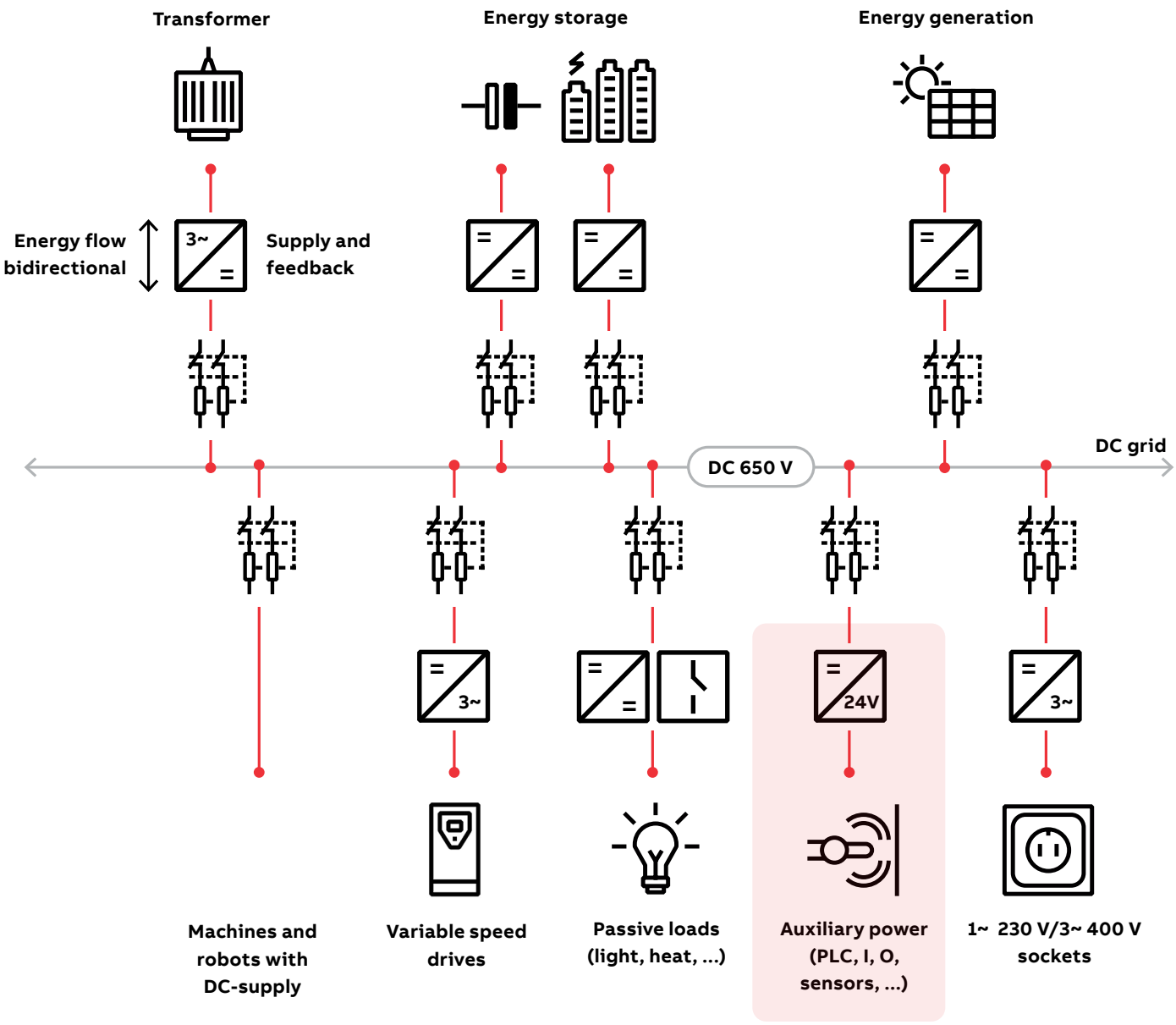


CP-S.DC POWER SUPPLIES

Application example, e.g. DC Industries

DC-Industries sets the standard for an open, user-friendly power supply system, enabling fast implementation.

Operating between 485 V and 750 V, it maximizes compatibility with standard technologies. If voltage exceeds 800 V or drops below 400 V, the grid automatically deactivates for safety.





RELIABLE USE OF POWER SUPPLIES IS THE EXISTENTIAL BASIS FOR SMOOTH OPERATION IN THE DATA CENTER

CP-S.1, CP-S.3, CP-S.DC power supplies
Description



ABB’s new generation of CP-S power supplies for machine building applications deliver high efficiency, high reliability and a minimized footprint. This advanced range of power supplies has an integrated 150 % power reserve functionality for up to 5 s and operate at an efficiency of up to 94 %.

They come equipped with overheat protection and active power factor correction*, combined with a broad AC and DC input voltage range and extensive worldwide approvals. Make the all-new CP-S.3 power supplies your preferred choice for professional three phase AC application. UL listing as well as marine approvals complete the assortment offering.

CP-S power supplies have a rated output voltage of 24 V DC that is adjustable via a front-face rotary potentiometer “OUTPUT Adjust”. The power supplies are available with rated output currents of 3.0 A, 5.0 A, 10 A, 20 A and 40 A. The rated output power ranges from 72 - 960 W and wide range of AC & DC supply voltage. The typical efficiency is up to 94 % with low power dissipation and low heating. CP-S power supplies have free convection cooling (no forced cooling with ventilators) and operate at an ambient temperature range from -25...+60 °C without derating (+70 °C with derating). They feature an open-circuit and are overload and short-circuit stable as well as an integrated input fuse.

Additionally, true redundancy for critical applications can be achieved with the optional redundancy units CP-C.1-A-RU which is available as an accessory. One LED on the front of the power supplies indicates the status and a OUTPUT OK relay contact “13-14” - signalling output "13-14".

CP-S.1, CP-S.3, CP-S.DC power supplies
Ordering details

ORDERING DETAILS - CP-S.1 POWER SUPPLIES

Description	Rated input voltage range	Rated output voltage	Rated output current	Output power	Power reserve	Coated PCBA	Order code
CP-S.1 24/3.0	100-240 V AC, 100-250 V DC	24 V DC	3.0 A	72 W	150 % I_N for up to 5 s	■	1SVR320361R1000
CP-S.1 24/5.0			5.0 A	120 W		■	1SVR320561R1000
CP-S.1 24/10.0			10.0 A	240 W		■	1SVR320661R1000
CP-S.1 24/20.0			20.0 A	480 W		■	1SVR320761R1000
CP-S.1 24/40.0	110-240 V AC, 110-250 V DC		40.0 A	960 W		■	1SVR320861R1000

ORDERING DETAILS - CP-S.3 POWER SUPPLIES

Description	Rated input voltage range	Rated output voltage	Rated output current	Output power	Power reserve	Coated PCBA	Order code
CP-S.3 24/5.0	3 ~ 400 - 500 V AC	24 V DC	5.0 A	120 W	150 % I_N for up to 5 s	■	1SVR340567R1000
CP-S.3 24/10.0			10.0 A	240 W		■	1SVR340667R1000
CP-S.3 24/20.0			20.0 A	480 W		■	1SVR340767R1000
CP-S.3 24/40.0			40.0 A	960 W		■	1SVR340867R1000

ORDERING DETAILS - CP-S.DC POWER SUPPLIES

Description	Rated input voltage range	Rated output voltage	Rated output current	Output power	Power reserve	Coated PCBA	Order code
CP-S.DC 24/20.0	600 V DC, 420 - 870 V DC	24 V DC	20.0 A	480 W	150 % I_N for up to 5 s	■	1SVR320766R1000

ORDERING DETAILS - REDUNDANCY UNIT

Description	Rated input voltage	Rated output voltage	Rated output current	Max output current	Coated PCBA	Order code
CP-C.1-A-RU	10 - 56 V DC	12 - 48 V DC	2 x 20 A or 1 x 40 A	2 x 30 A or 1 x 60 A	—	1SVR360060R1001
CP-C.1-A-RU-C					■	1SVR360060R2001

ORDERING DETAILS - CP-B BUFFER MODULES

Description	Rated input voltage	Rated current	Energy storage (min.)	Order code
CP-B 24/3.0	24 V DC	3 A	1000 Ws	1SVR427060R0300
CP-B 24/10.0	24 V DC	10 A	13700 Ws	1SVR427060R1000
CP-B 24/20.0	24 V DC	20 A	8000 Ws	1SVR427060R2000



CP-C.1-A-RU



CP-B 24/20.0

CP-S.1 power supplies
Technical data

Data at T_a = 25 °C and rated values (U_{in} = 230 V AC), unless otherwise indicated

Type			CP-S.1 24/3.0	CP-S.1 24/5.0	CP-S.1 24/10.0	CP-S.1 24/20.0	CP-S.1 24/40.0
Input circuit - Supply circuit (L(+), N(-))							
Rated input voltage U_{in}						100 - 240 V AC, 100 - 250 V DC	110 - 240 V AC, 110 - 250 V DC
Input voltage range						85 - 264 V AC / 90 - 277 V DC	99 - 264 V AC / 99 - 277 V DC
Input current range at rated output power		100 - 240 V AC	0.95 - 1.46 A	0.67 - 1.45 A	1.25 - 2.8 A	2.55 - 5.8 A	5.0 - 11.5 A
		100 - 250 V DC	0.35 - 1.0 A	0.58 - 1.63 A	1.12 - 3.15 A	2.28 - 6.4 A	4.48 - 13.5 A
Typical input current		at 115 V AC	1.52 A	1.24 A	2.45 A	4.85 A	9.5 A
		at 230 V AC	0.95 A	0.67 A	1.25 A	2.55 A	5.0 A
Max. power consumption		at 230 V AC	82 W	132 W	258 W	517 W	1,022 W
Rated frequency							DC, 50 / 60 Hz
Frequency range		AC					45 - 65 Hz
Inrush current limiting, cold state			≤ 11 A	≤ 11 A	≤ 11 A	≤ 12.8 A	≤ 19 A
Let-through energy I^2t, cold state		at 230 V AC	< 1.5 A^2s	< 1.2 A^2s	< 1.7 A^2s	< 3 A^2s	< 5 A^2s
Discharge current towards PE							< 3.5 mA
Hold-up time		at 115 V AC	> 10 ms	> 20 ms	> 15 ms	> 15 ms	> 20 ms
		at 230 V AC	> 20 ms	> 30 ms	> 20 ms	> 20 ms	> 20 ms
Internal input fuse							Yes
Recommended backup fuse for wire protection at 1.5 mm^2			1 pole miniature circuit breaker ABB type S 200 (for USA/CAN: use appropriate branch circuit 20 A fuse acc. to regional and national regulation)				
		characteristic					B or C
		max. rating					16 A
Power Factor Correction (PFC)			no				yes, active
Transient over-voltage protection							yes, varistor
User interface - Indication of operational states							
Output voltage	LED ‚OUTPUT OK'	Green					≥ 92 % of adjusted U_{out}
	LED ‚OUTPUT OK'	Flash					< 90 % of adjusted U_{out}
Output circuits - power output (L+, L-)							
Rated output voltage							24 V DC
Tolerance of the output voltage							± 1 %
Adjustment range of the output voltage							24...28 V DC
Rated output power			72 W	120 W	240 W	480 W	960 W
Rated output current I_R		-25°C ≤ T_a ≤ 60 °C	3 A	5 A	10 A	20 A	-
		-25°C ≤ T_a ≤ 55 °C				-	40 A
Power reserve current		-25°C ≤ T_a ≤ 60 °C	4.5 A (5 s)	7.5 A (5 s)	15 A (5 s)	30 A (5 s)	60 A (5 s) / -25°C≤ T_a ≤ 55°C
Short-circuit current limiting			< 5.2 A	< 8.62 A	< 17.25 A	< 34.5 A	< 70 A
Derating of the output current		60 °C ≤ T_a ≤ 70 °C				2.5 % / K	-
		55 °C ≤ T_a ≤ 70 °C				-	2 % / K
Deviation width of output voltage	Load effect/ load regulation	static load change: 25 - 100 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %
	Transient response of voltage to load current changes	dynamic load change:	0 % - 100 %: < 3 %	0 % - 100 %: < 3 %	10 % - 100 %: < 3 %	10 % - 100 %: < 5 %	10 % - 100 %: < 3 %
		recovery time T_R	< 1 ms	< 1 ms	< 1 ms	< 1 ms	< 1 ms
	Change of input voltage	within the rated input voltage	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Starting time after applying the supply voltage			< 1,500 ms	< 1,500 ms	< 1,500 ms	< 1,500 ms	< 1,500 ms
Residual ripple and switching peaks		BW = 20 MHz					< 75 mV_{pp}, class A
Parallel connection							yes, up to 3
Series connection							yes, 2

CP-S.1 power supplies
Technical data

Type		CP-S.1 24/3.0	CP-S.1 24/5.0	CP-S.1 24/10.0	CP-S.1 24/20.0	CP-S.1 24/40.0
No-load, overload and short-circuit behavior						
Characteristic curve of output		U/I characteristic curve			U/I characteristic curve combined with foldback behavior	
Short-circuit protection		continuous short-circuit stability				
Short-circuit behavior		current limiting				
Resistance to reverse feed		≤ 35 V DC				
Overvoltage protection		yes, < 35 V				
Overload protection		constant current limitation				
Overtemperature protection		protection by switch off in case of overtemperature (thermal)				
No-load protection		continuous no-load stability				
Starting of capacitive loads		Yes				
Signaling outputs - OUTPUT OK signaling output						
Type of output	13 - 14	relay, n/o contact				
ON (contact closed)		≥ 92 % of adjusted U_{out}				
OFF (contact open)		< 90 % of adjusted U_{out}				
Contact ratings	max. switching voltage / current	24 V DC - 1 A (resistive load)				
	min. switching voltage / current	5 V DC / 1 mA				
General data						
Efficiency	at rated load	> 89 %	> 90 %	> 93 %	> 93 %	> 94 %
Power losses	at rated load	< 10 W	< 12 W	< 18 W	< 37 W	< 62 W
	at 50 % of rated load	< 6.5 W	< 9.5 W	< 14 W	< 24 W	< 45 W
	at no load	< 2.8 W	< 3.5 W	< 5 W	< 6 W	< 6.5 W
Duty time		100 %				
MTBF	acc. to MIL 217 HDBK GB 25	on request				
Dimensions (W x H x D)	mm	30.5 x 129.4 x 126.8	35.5 x 129.4 x 126.8	40 x 129.4 x 126.8	68 x 129.4 x 126.8	125 x 129.4 x 126.8
Weight		550 g	690 g	830 g	1,355 g	2,490 g
Material of housing	cover	zinc-coated sheet-steel				
	housing shell	aluminium				
	front label	adhesive plastic GE8B35 (PC 0.25 mm), V0				
Mounting		DIN rail (IEC/EN 60715), snap-on mounting				
Mounting position		position 1 (standard orientation); other mounting positions possible with derating / deratings are available on demand				
Minimum distance to other units	horizontal	30 mm				
	vertical	50 mm				
Degree of protection (IEC/EN 60529)	housing / terminals	IP20 / IP20				
Protection class (IEC/EN 61140)		I				
Electrical connection						
Connecting capacity	rigid	0.5-2.5 mm² (20-14 AWG)	0.5-4.0 mm² (20-12 AWG)	0.5-4.0 mm² (20-12 AWG)	0.5-4.0 mm² (20-12 AWG)	0.5-10.0 mm² (20-8 AWG)
	fine-strand with(out) wire end ferrule	0.5-2.5 mm² (26-14 AWG)	0.5-4.0 mm² (20-12 AWG)	0.5-4.0 mm² (20-12 AWG)	0.5-4.0 mm² (20-12 AWG)	0.5-10.0 mm² (20-8 AWG)
Stripping length		9 mm	9 mm	9 mm	9 mm	10 mm
Tightening torque		0.5 Nm 4.43 lb.in	0.5 Nm 4.43 lb.in	0.5 Nm 4.43 lb.in	0.5 Nm 4.43 lb.in	1.47 Nm 13.0 lb.in
Recommended screw driver		PH0 / Ø 3.5 x 0.6 mm	PH1 / Ø 4.0 x 0.8 mm	PH1 / Ø 4.0 x 0.8 mm	PH1 / Ø 4.0 x 0.8 mm	PH2 / Ø 5.5 x 1.0 mm

CP-S.1 power supplies
Technical data

Type		CP-S.1 24/3.0	CP-S.1 24/5.0	CP-S.1 24/10.0	CP-S.1 24/20.0	CP-S.1 24/40.0
Output circuits (L+, L+, L-, L-)						
Stripping length		9 mm	9 mm	9 mm	9 mm	10 mm
Tightening torque		0.5 Nm 4.43 lb.in	1.13 Nm 10 lb.in	1.13 Nm 10 lb.in	1.13 Nm 10 lb.in	1.47 Nm 13.0 lb.in
Recommended screw driver		PH0 / Ø 3.5 x 0.6 mm	PH1 / Ø 4.0 x 0.8 mm	PH1 / Ø 4.0 x 0.8 mm	PH1 / Ø 4.0 x 0.8 mm	PH2 / Ø 5.5 x 1.0 mm
Signalling output (13-14)						
Connecting capacity	rigid	0.15 - 0.8 mm² (26 - 18 AWG)				
	fine-strand with(out) wire end ferrule	0.15 - 0.8 mm² (26 - 18 AWG)				
Stripping length		7 mm				
Connection terminals		push-in				
Environmental data						
Ambient temperature range	operation	-25…+70 °C (-13… +158 °F)				
	rated output power	-25…+60 °C (-13… +140 °F)				-25…+55 °C (-13… +131 °F)
	storage	-40…+85 °C (-40… +185 °F)				
	transportation	-40…+85 °C (-40… +185 °F)				
Climatic class (IEC/EN 60721-3-1)	storage	1K2				
Climatic class (IEC/EN 60721-3-2)	transportation	2K2				
Climatic class (IEC/EN 60721-3-3)	operation	3K3				
Damp heat, cyclic (IEC/EN 60068-2-30)		test Db: 55 °C, 2 cycles				
Vibration (IEC/EN 60068-2-6)		test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis				
Shock, half-sine (IEC/EN 60068-2-27)		test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis				
Location classes (according DNV)		temperature: B / humidity: B / vibration: A / enclosure: A				
Coated PCBA		yes				
Isolation data						
Rated impulse withstand voltage U_{imp} (IEC/EN 62477-1)	input circuit / output circuit	4 kV (1.2/50 µs)				
	input circuit / PE	4 kV (1.2/50 µs)				
	input circuit / relay contact	4 kV (1.2/50 µs)				
	output circuit / relay contact	0.8 kV (1.2/50 µs)				
	relay contact / PE	0.8 kV (1.2/50 µs)				
	output circuit / PE	0.8 kV (1.2/50 µs)				
Rated insulation voltage U_i (IEC/EN 62477-1)	input circuit / output circuit	300 V				
	input circuit / PE	300 V				
	input circuit / relay contact	300 V				
	output circuit / relay contact	50 V				
	relay contact / PE	50 V				
	output circuit / PE	50 V				
Overvoltage category (IEC/EN 62477-1)	< 2000 m	III				
	2000…5000 m	II				
Overvoltage category (IEC/EN 61010-1/IEC/ EN 61010-2-201)	< 2000 m	II				
	2000 …5000 m	II				
Pollution degree		2				
Protective separation IEC/EN 61010-1, 61010-2-201	input circuit / output circuit	yes				
	input circuit / relay output	yes				

CP-S.1 power supplies
Technical data

Type		CP-S.1 24/3.0	CP-S.1 24/5.0	CP-S.1 24/10.0	CP-S.1 24/20.0	CP-S.1 24/40.0
Standards / Directives						
Low Voltage Directive		2014/35/EU, IEC/EN 61204				
EMC directive		2014/30/EU				
RoHS directive		2011/65/EU incl. 2015/863/EU				
WEEE directive		2012/19/EU				
Electrical safety		IEC/EN 61010-1. IEC/EN 61010-2-201				
Process control equipment		UL 61010-1, UL 61010-2-201/ CAN/CSA C22.2 No. 61010-1-12, CAN/CSA-IEC 61010-2-201:18				
Protective extra low voltage		PELV_IEC/EN 61010-2-201				
Safety extra low voltage		SELV_IEC/EN 61010-2-201				
Limitation of harmonic line currents		IEC/EN 61010-2-201				
Electromagnetic compatibility						
Low-voltage power supplies, d.c. output – Part 3: Electromagnetic compatibility (EMC)		IEC/EN 61204-3				
Interference immunity to		IEC/EN 61000-6-2				
electrostatic discharge (ESD)	IEC/EN 61000-4-2	contact discharge air discharge, level 4, 8 kV / 15 kV (criterion A)				
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	80 to 1000 MHz, 10 V/m (criterion A), 1.4 to 6 GHz, 3 V/m (criterion A)				
electrical fast transient / burst	IEC/EN 61000-4-4	level 4, 4 kV / 2 kV (criterion A)				
surge	IEC/EN 61000-4-5	level 4, L/N 3 kV (criterion A); level 4, L, N / PE 4 kV (criterion A)				
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3, 10 V (criterion A)				
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	class 3				
harmonics and interharmonics	IEC/EN 61000-4-13	class 3 (criterion A)				
conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	IEC/EN 61000-4-1	level 3, 10 V				
Interference emission		IEC/EN 61000-6-3; IEC/EN 61000-6-4				
limits for harmonic current emissions	IEC/EN 61000-3-2	class A				
limitation of voltage changes etc.	IEC/EN 61000-3-3	compliant				
Electromagnetic compatibility of multimedia equipment - Emission requirements	IEC/CISPR 32, EN 55032	class B				
industrial scientific and medical (ISM) radio-frequency equipment electromagnetic disturbance characteristics limits and methods of measurement	EC/CISPR 11, EN 55011 EN 50204	class B				
Voltage sags	SEMI F47-0706	passed				
Federal Communications Commission	FCC15	compliant				
EMC according DNV	DNV-CG-0339	all locations including bridge and open deck class B				

CP-S.3 power supplies
Technical data

Data at T_a = 25 °C and rated values (U_{in} = 400 V AC), unless otherwise indicated

Type			CP-S.3 24/5.0	CP-S.3 24/10.0	CP-S.3 24/20.0	CP-S.3 24/40.0
Input circuit - Supply circuit (L(+), N(-))						
Rated input voltage U_{in}						3~ 400 - 500 V AC
Input voltage range						3~ 320 - 575 V AC
Typical input current		3~ 400 V AC	0.39 A	0.42 A	0.78 A	1.55 A
		3~ 500 V AC	0.35 A	0.37 A	0.63 A	1.23 A
		2~ 400 V AC	0.75 A	0.60 A	1.22 A	2.30 A
		2~ 500 V AC	0.65 A	0.47 A	1.23 A	2.25 A
Typical power consumption		3~ 500 V AC	134 W	258 W	516.1 W	1,021.2 W
Rated frequency		DC				50 / 60 Hz
Frequency range		AC				45 - 66 Hz
Inrush current limiting, cold state			≤ 11 A	≤ 11 A	≤ 12.8 A	≤ 19 A
Let-through energy I^2t, cold state		at 230 V AC	< 1.2 A^2s	< 1.7 A^2s	< 3 A^2s	< 5 A^2s
Discharge current towards PE						< 3.5 mA
Hold-up time		at 115 V AC	> 20 ms	> 20 ms	> 20 ms	> 20 ms
		at 230 V AC	> 30 ms	> 20 ms	> 20 ms	> 20 ms
Internal input fuse						Yes
Recommended backup fuse for wire protection at 1.5 mm^2			3 pole miniature circuit breaker ABB type S 200 (for USA/CAN: use appropriate branch circuit 10 A fuse acc. to regional and national regulation)			
		characteristic				B or C
		max. rating				10 A
Power Factor Correction (PFC)						yes, active
Transient over-voltage protection						yes, varistor
User interface - Indication of operational states						
Output voltage	LED ‚OUTPUT OK'	Green				≥ 92 % of adjusted U_{out}
	LED ‚OUTPUT OK'	Flash				< 90 % of adjusted U_{out}
Output circuits - power output (L+, L-)						
Rated output voltage						24 V DC
Tolerance of the output voltage						± 1 %
Adjustment range of the output voltage						24…28 V DC
Rated output power			120 W	240 W	480 W	960 W
Rated output current I_R		-25°C ≤ T_a ≤ 60 °C	5 A	10 A	20 A	40 A
Dynamic Boost output current		for 5 s	7.5 A (5 s)	15 A (5 s	30 A (5 s)	60 A (5 s)
Short-circuit current limiting			< 8.62 A	< 17.25 A	< 34.5 A	< 70 A
Derating of the output current		60 °C ≤ T_a ≤ 70 °C				2.5 % / K
Deviation width of output voltage	Load effect/ load regulation	static load change: 25 - 100 %				< 1 %
	Transient response of voltage to load current changes	dynamic load change:				10 % - 100 %: < 3 %
		recovery time T_R				< 1 ms
	Change of input voltage	within the rated input voltage				< 0.5%
Starting time after applying the supply voltage						< 1,500 ms
Residual ripple and switching peaks		BW = 20 MHz				< 75 mV_{pp}, class A
Parallel connection						yes, up to 3
Series connection						yes, 2

CP-S.3 power supplies
Technical data

Type		CP-S.3 24/5.0	CP-S.3 24/10.0	CP-S.3 24/20.0	CP-S.3 24/40.0
No-load, overload and short-circuit behavior					
Characteristic curve of output		U/I characteristic curve		U/I characteristic curve combined with foldback behavior	
Short-circuit protection		continuous short-circuit stability			
Short-circuit behavior		current limiting			
Resistance to reverse feed		≤ 35 V DC			
Overvoltage protection		yes, < 35 V			
Overload protection		constant current limitation			
Overtemperature protection		protection by switch off in case of overtemperature (thermal protection), automatic restart			
No-load protection		continuous no-load stability			
Starting of capacitive loads		Yes, up to 1.68 F			
Signaling outputs - OUTPUT OK					
Type of output	13 - 14	relay, n/o contact			
ON (contact closed)		≥ 92 % of adjusted U_{out}			
OFF (contact open)		< 90 % of adjusted U_{out}			
Contact ratings	max. switching voltage / current	24 V AC - 1 A (resistive load)			
	min. switching voltage / current	5 V DC / 1 mA			
General data					
Efficiency	at rated load	> 90 % @ 400 V AC	> 93 %	> 94 %	> 94 %
Power losses	at rated load	< 16 W	< 25 W	< 44 W	< 85 W
	at 50 % of rated load	< 9.5 W	< 17 W	< 27.5 W	< 54 W
	at no load	< 3.5 W	< 5 W	< 6 W	< 6.5 W
Duty time		100 %			
MTBF	acc. to MIL 217 HDBK GB 25	on request			
Dimensions (W x H x D)	mm	35.5 x 129.4 x 126.8	40 x 129.4 x 126.8	68 x 129.4 x 126.8	125 x 129.4 x 126.8
Weight		0.60 kg	0.85 kg	1.27 kg	2.20 kg
Material of housing	cover	zinc-coated sheet-steel			
	housing shell	aluminium			
	front label	adhesive plastic GE8B35 (PC 0.25 mm), V0			
Mounting		DIN rail (IEC/EN 60715), snap-on mounting			
Mounting position		position 1 (standard orientation); other mounting positions possible with derating / deratings are available on demand			
Minimum distance to other units	horizontal	25 mm			
	vertical	50 mm			
Degree of protection (IEC/EN 60529)	housing / terminals	IP20 / IP20			
Protection class (IEC/EN 61140)		I			
Electrical connection - Input circuits (L1, L2, L3, PE)					
Connecting capacity	rigid			0.5-4.0 mm² (20-12 AWG)	0.5-10.0 mm² (20-8 AWG)
	fine-strand with(out) wire end ferrule			0.5-4.0 mm² (20-12 AWG)	0.5-10.0 mm² (20-8 AWG)
Stripping length				9 mm	10 mm
Tightening torque				0.79 Nm (7 lb.in)	1.47 Nm (13.0 lb.in)
Recommended screw driver				PH1 / Ø 4.0 x 0.8 mm	PH2 / Ø 5.5 x 1.0 mm

CP-S.3 power supplies
Technical data

Type		CP-S.3 24/5.0	CP-S.3 24/10.0	CP-S.3 24/20.0	CP-S.3 24/40.0
Output circuits (L+, L+, L-, L-)					
Connection capacity	rigid			0.5 - 4.0 mm² (20 - 12 AWG)	0.5 - 10.0 mm² (20 - 8 AWG)
	fine-strand with(out) wire end ferrule			0.5 - 4.0 mm² (20 - 12 AWG)	0.5 - 10.0 mm² (20 - 8 AWG)
Stripping length				9 mm	10 mm
Tightening torque				0.56 Nm min. (5 lb.in)	2.03 Nm (18.0 lb.in)
Recommended screw driver				5 A, 10 A, 20 A - PH1 / Ø 4.0 x 0.8 mm 40 A - PH2 / Ø 5.5 x 1.0 mm	
Signalling output (13-14)					
Connecting capacity	rigid			0.2 - 0.8 mm² (24 - 18 AWG)	
	fine-strand with(out) wire end ferrule			0.2 - 0.8 mm² (24 - 18 AWG)	
Stripping length				7 mm	
Connection terminals				push-in	
Environmental data					
Ambient temperature range	operation			-25…+70 °C (-13… +158 °F)	
	rated output power			-25…+60 °C (-13… +140 °F)	
	storage			-40…+85 °C (-40… +185 °F)	
	transportation			-40…+85 °C (-40… +185 °F)	
Climatic class (IEC/EN 60721-3-1)	storage			1K2	
Climatic class (IEC/EN 60721-3-2)	transportation			2K2	
Climatic class (IEC/EN 60721-3-3)	operation			3K3	
Damp heat, cyclic (IEC/EN 60068-2-30)				test Db: 55 °C, 2 cycles	
Vibration (IEC/EN 60068-2-6)				test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis	
Shock, half-sine (IEC/EN 60068-2-27)				test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis	
Location classes (according DNV)				temperature: B / humidity: B / vibration: A / enclosure: A	
Coated PCBA				yes	
Isolation data					
Rated impulse withstand voltage U_{imp} (IEC/EN 62477-1)	input circuit / output circuit			8 kV (1.2/50 µs)	
	input circuit / PE			6 kV (1.2/50 µs)	
	input circuit / relay contact			8 kV (1.2/50 µs)	
	output circuit / relay contact			0.8 kV (1.2/50 µs)	
	relay contact / PE			0.8 kV (1.2/50 µs)	
	output circuit / PE			0.8 kV (1.2/50 µs)	
Rated insulation voltage U_i (IEC/EN 62477-1)	input circuit / output circuit			600 V	
	input circuit / PE			300 V	
	input circuit / relay contact			600 V	
	output circuit / relay contact			50 V	
	relay contact / PE			50 V	
	output circuit / PE			50 V	
Overvoltage category (IEC/EN 62477-1)	< 2000 m			III	
	2000…5000 m			II	
Overvoltage category (IEC/EN 61010-1/IEC/ EN 61010-2-201)	< 2000 m			II	
	2000 …5000 m			II	
Pollution degree				2	
Protective separation IEC/EN 61010-1, 61010-2-201	input circuit / output circuit			yes	
	input circuit / relay output			yes	

CP-S.3 power supplies
Technical data

Type		CP-S.3 24/5.0	CP-S.3 24/10.0	CP-S.3 24/20.0	CP-S.324/40.0
Standards / Directives					
Low Voltage Directive					2014/35/EU
EMC directive					2014/30/EU
RoHS directive					2011/65/EU incl. 2015/863/EU
WEEE directive					2012/19/EU
Electrical safety					IEC/EN 61010-1. IEC/EN 61010-2-201
Process control equipment					UL 61010-1, UL 61010-2-201/ CAN/CSA C22.2 No. 61010-1-12, CAN/CSA-IEC 61010-2-201:18
Protective extra low voltage					PELV_IEC/EN 61010-2-201
Safety extra low voltage					SELV_IEC/EN 61010-2-201
Limitation of harmonic line currents					IEC/EN 61010-2-201
Electromagnetic compatibility					
Low-voltage power supplies, d.c. output – Part 3: Electromagnetic compatibility (EMC)					IEC/EN 61204-3
Interference immunity to					IEC/EN 61000-6-2
electrostatic discharge (ESD)	IEC/EN 61000-4-2				contact discharge air discharge, level 4, 8 kV / 15 kV (criterion A)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3				80 MHz - 1 GHz, 10 V/m; 1.4 to 6 GHz, 3 V/m (criterion A)
electrical fast transient / burst	IEC/EN 61000-4-4				level 4, 4 kV / 2 kV (criterion A)
surge	IEC/EN 61000-4-5				level 4, L/N 3 kV (criterion A); level 4, L, N / PE 4 kV (criterion A)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6				level 3, 10 V (criterion A)
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11				class 3
harmonics and interharmonics	IEC/EN 61000-4-13				class 3 (criterion A)
conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	IEC/EN 61000-4-1				level 3, 10 V
Interference emission					IEC/EN 61000-6-3; IEC/EN 61000-6-4
limits for harmonic current emissions	IEC/EN 61000-3-2				class A
limitation of voltage changes etc.	IEC/EN 61000-3-3				compliant
Electromagnetic compatibility of multimedia equipment - Emission requirements	IEC/CISPR 32, EN 55032				class B
industrial scientific and medical (ISM) radio-frequency equipment electromagnetic disturbance characteristics limits and methods of measurement	EC/CISPR 11, EN 55011 EN 50204				class B
Voltage sags	SEMI F47-0706				passed
Federal Communications Commission	FCC15				compliant
EMC according DNV	DNV-CG-0339				all locations including bridge and open deck class B

CP-S.DC power supplies
Technical data

Data at T_a = 25 °C and rated values (U_{in} = 600 V DC), unless otherwise indicated

Type			CP-S.DC 24/20.0
Input circuit - Supply circuit (+, -, PE)			
Rated input voltage U_{in}			600 V DC
Input voltage range		DC	420 - 870 V DC
Typical input current			0.85 A
Typical power consumption			516.1 W
Inrush current limiting, cold state			≤ 12.8 A
Let-through energy I^2t, cold state			< 3 A^2s
Discharge current towards PE			< 3.5 mA
Hold-up time			> 20 ms
Internal input fuse			Yes
Recommended backup fuse for wire protection at 1.5 mm^2			On
		characteristic	B or C
		max. rating	10 A
Transient over-voltage protection			yes, varistor
User interface - Indication of operational states			
Output voltage	LED ‚OUTPUT OK'	Green	≥ 92 % of adjusted U_{out}
	LED ‚OUTPUT OK'	Flash	< 90 % of adjusted U_{out}
Output circuits - power output (L+, L-)			
Rated output voltage			24 V DC
Tolerance of the output voltage			± 1 %
Adjustment range of the output voltage			24…28 V DC
Rated output power			480 W
Rated output current I_R		-25°C ≤ T_a ≤ 60 °C	20 A
Dynamic Boost output current		for 5 s	30 A (5 s)
Short-circuit current limiting			< 34.5 A
Derating of the output current		60 °C ≤ T_a ≤ 70 °C	2.5 % / K
Deviation width of output voltage	Load effect/ load regulation	static load change: 25 - 100 %	< 1 %
	Transient response of voltage to load current changes	dynamic load change:	10 % - 100 %: < 3 %
		recovery time T_R	< 1 ms
	Change of input voltage	within the rated input voltage	< 0.5%
Starting time after applying the supply voltage			< 1,500 ms
Residual ripple and switching peaks		BW = 20 MHz	< 75 mV_{pp}, class A
Parallel connection			yes, up to 3
Series connection			yes, 2
No-load, overload and short-circuit behavior			
Characteristic curve of output			U/I characteristic curve combined with foldback behavior
Short-circuit protection			continuous short-circuit stability
Short-circuit behavior			current limiting
Resistance to reverse feed			≤ 35 V DC
Overvoltage protection			yes, < 35 V
Overload protection			constant current limitation
Overtemperature protection			protection by switch off in case of overtemperature (thermal protection), automatic restart
No-load protection			continuous no-load stability
Starting of capacitive loads			Yes, up to 1.68 F

CP-S.DC power supplies

Technical data

Type		CP-S.DC 24/20.0
Signaling outputs - OUTPUT OK		
Type of output	13 - 14	relay, n/o contact
ON (contact closed)		≥ 92 % of adjusted U_{out}
OFF (contact open)		< 90 % of adjusted U_{out}
Contact ratings	max. switching voltage / current	24 V AC - 1 A (resistive load)
	min. switching voltage / current	5 V DC / 1 mA
General data		
Efficiency	at rated load	> 94 %
Power losses	at rated load	< 44 W
	at 50 % of rated load	< 27.5 W
	at no load	< 6 W
Duty time		100 %
MTBF	acc. to MIL 217 HDBK GB 25	on request
Dimensions (W x H x D)	mm	68 x 129.4 x 126.8
Weight		1.25 kg
Material of housing	cover	zinc-coated sheet-steel
	housing shell	aluminium
	front label	adhesive plastic GE8B35 (PC 0.25 mm), V0
Mounting		DIN rail (IEC/EN 60715), snap-on mounting
Mounting position		position 1 (standard orientation); other mounting positions possible with derating / deratings are available on demand
Minimum distance to other units	horizontal	25 mm
	vertical	50 mm
Degree of protection (IEC/EN 60529)	housing / terminals	IP20 / IP20
Protection class (IEC/EN 61140)		I
Electrical connection - Input circuits (L1, L2, L3, PE)		
Connecting capacity	rigid	0.5-4.0 mm² (20-12 AWG)
	fine-strand with(out) wire end ferrule	0.5-4.0 mm² (20-12 AWG)
Stripping length		9 mm
Tightening torque		0.5 Nm (4.43 lb.in)
Recommended screw driver		PH1 / Ø 4.0 x 0.8 mm
Output circuits (L+, L+, L-, L-)		
Connection capacity	rigid	0.5 - 4.0 mm² (20 - 12 AWG)
	fine-strand with(out) wire end ferrule	0.5 - 4.0 mm² (20 - 12 AWG)
Stripping length		9 mm
Tightening torque		1.13 Nm min. (10 lb.in)
Recommended screw driver		PH1 / Ø 4.0 x 0.8 mm
Signalling output (13-14)		
Connection capacity	rigid	0.15 - 0.8 mm² (26 - 18 AWG)
	fine-strand with(out) wire end ferrule	0.15 - 0.8 mm² (26 - 18 AWG)
Stripping length		7 mm
Connection terminals		push-in

CP-S.DC power supplies

Technical data

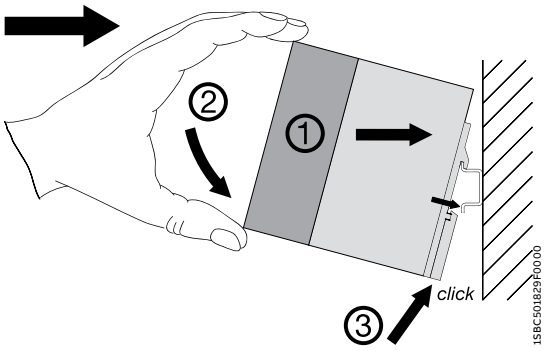
Type		CP-S.DC 24/20.0
Environmental data		
Ambient temperature range	operation	-25…+70 °C (-13… +158 °F)
	rated output power	-25…+60 °C (-13… +140 °F)
	storage	-40…+85 °C (-40… +185 °F)
	transportation	-40…+85 °C (-40… +185 °F)
Climatic class (IEC/EN 60721-3-1)	storage	1K2
Climatic class (IEC/EN 60721-3-2)	transportation	2K2
Climatic class (IEC/EN 60721-3-3)	operation	3K3
Damp heat, cyclic (IEC/EN 60068-2-30)		test Db: 55 °C, 2 cycles
Vibration (IEC/EN 60068-2-6)		test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis
Shock, half-sine (IEC/EN 60068-2-27)		test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis
Location classes (according DNV)		temperature: B / humidity: B / vibration: A / enclosure: A
Coated PCBA		yes
Isolation data		
Rated impulse withstand voltage U_{imp} (IEC/EN 62477-1)	input circuit / output circuit	8 kV (1.2/50 µs)
	input circuit / PE	6 kV (1.2/50 µs)
	input circuit / relay contact	8 kV (1.2/50 µs)
	output circuit / relay contact	0.8 kV (1.2/50 µs)
	relay contact / PE	0.8 kV (1.2/50 µs)
	output circuit / PE	0.8 kV (1.2/50 µs)
Rated insulation voltage U_i (IEC/EN 62477-1)	input circuit / output circuit	600 V
	input circuit / PE	300 V
	input circuit / relay contact	600 V
	output circuit / relay contact	50 V
	relay contact / PE	50 V
	output circuit / PE	50 V
Overvoltage category (IEC/EN 62477-1)	< 2000 m	III
	2000…5000 m	II
Overvoltage category (IEC/EN 61010-1/IEC/ EN 61010-2-201)	< 2000 m	II
	2000 …5000 m	II
Pollution degree		2
Protective separation IEC/EN 61010-1, 61010-2-201	input circuit / output circuit	yes
	input circuit / relay output	yes
Standards / Directives		
Low Voltage Directive		2014/35/EU
EMC directive		2014/30/EU
RoHS directive		2011/65/EU incl. 2015/863/EU
WEEE directive		2012/19/EU
Electrical safety		IEC/EN 61010-1. IEC/EN 61010-2-201
Process control equipment		UL 61010-1, UL 61010-2-201/ CAN/CSA C22.2 No. 61010-1-12, CAN/CSA-IEC 61010-2-201:18
Protective extra low voltage		PELV_IEC/EN 61010-2-201
Safety extra low voltage		SELV_IEC/EN 61010-2-201
Limitation of harmonic line currents		IEC/EN 61010-2-201

CP-S.DC power supplies
Technical data

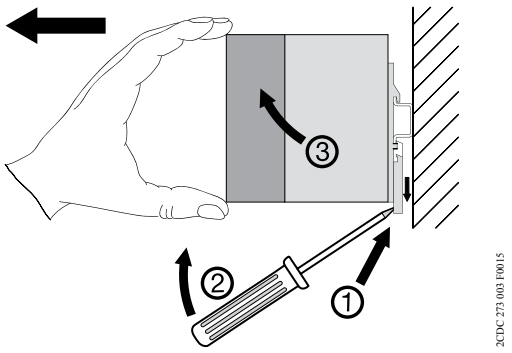
Type		CP-S.DC 24/20.0
Electromagnetic compatibility		
Low-voltage power supplies, d.c. output – Part 3: Electromagnetic compatibility (EMC)		IEC/EN 61204-3
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge (ESD)	IEC/EN 61000-4-2	contact discharge air discharge, level 4, 8 kV / 15 kV (criterion A)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	80 MHz - 1 GHz, 10 V/m; 1.4 to 6 GHz, 3 V/m (criterion A)
electrical fast transient / burst	IEC/EN 61000-4-4	level 4, 4 kV / 2 kV (criterion A)
surge	IEC/EN 61000-4-5	level 4, L/N 3 kV (criterion A); level 4, L, N / PE 4 kV (criterion A)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	F0: level 3, 10 V (criterion A); F2: 0.15 - 80 MHz, 20 V (criterion A)
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	class 3
harmonics and interharmonics	IEC/EN 61000-4-13	class 3 (criterion A)
conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	IEC/EN 61000-4-1	level 3, 10 V
Interference emission		IEC/EN 61000-6-3; IEC/EN 61000-6-4
limits for harmonic current emissions	IEC/EN 61000-3-2	class A
limitation of voltage changes etc.	IEC/EN 61000-3-3	compliant
Electromagnetic compatibility of multimedia equipment - Emission requirements	IEC/CISPR 32, EN 55032	class B
industrial scientific and medical (ISM) radio-frequency equipment electromagnetic disturbance characteristics limits and methods of measurement	EC/CISPR 11, EN 55011 EN 50204	class B
Voltage sags	SEMI F47-0706	passed
Federal Communications Commission	FCC15	compliant
EMC according DNV	DNV-CG-0339	all locations including bridge and open deck class B

CP-S power supplies
Technical diagrams

CP-S
MOUNTING AND DISMOUNTING

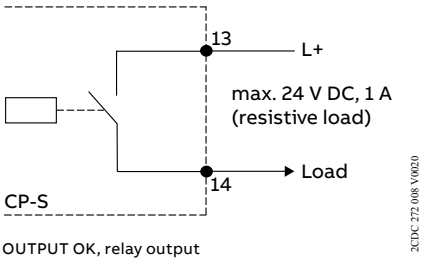


Mounting



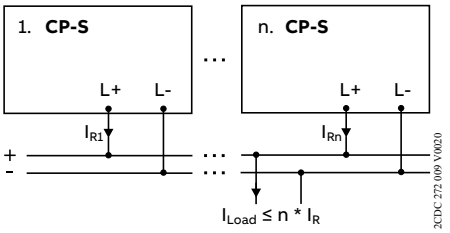
Dismounting

CP-S
WIRING INSTRUCTIONS

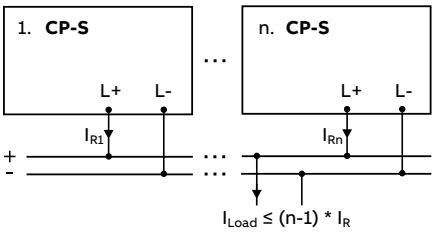


OUTPUT OK, relay output

Rated voltage limits of the signaling output relay:
Acc. UL 61010-1: 30 V RMS, 42.4 V peak, 60 V DC



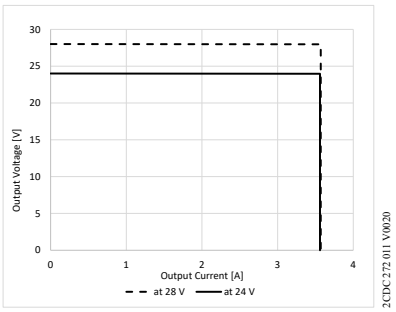
Parallel operation, increased power (n ≤ 3)



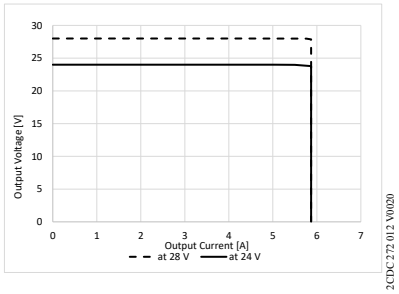
Parallel operation, redundancy (n ≤ 3)

CP-S power supplies
Technical diagrams

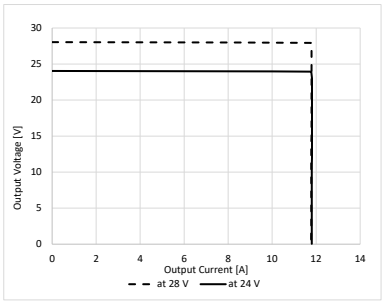
CP-S.1
U/I CHARACTERISTIC CURVES OF OUTPUT AT T_A = 25 °C



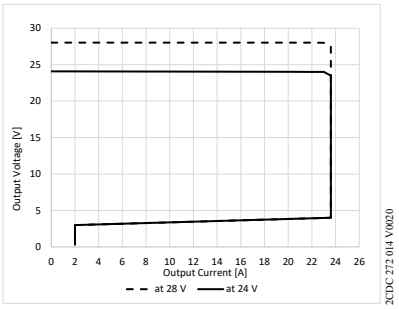
CP-S.1 24/3.0



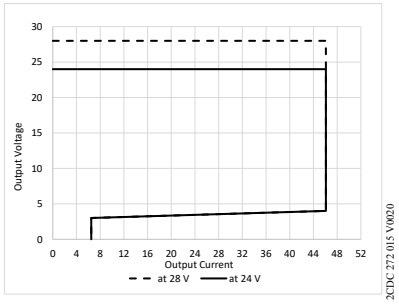
CP-S.1 24/5.0



CP-S.1 24/10.0

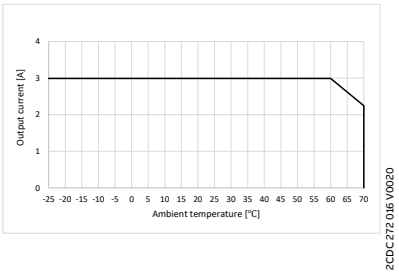


CP-S.1 24/20.0

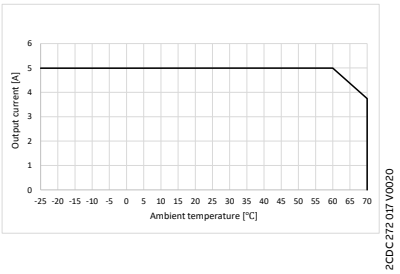


CP-S.1 24/40.0

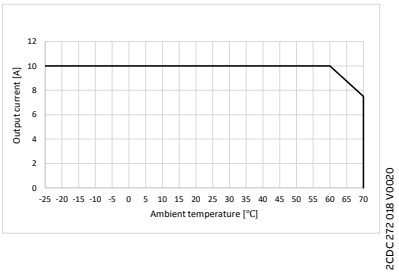
CP-S.1
CHARACTERISTIC CURVES OF TEMPERATURE U_{OUT} = 24 V DC



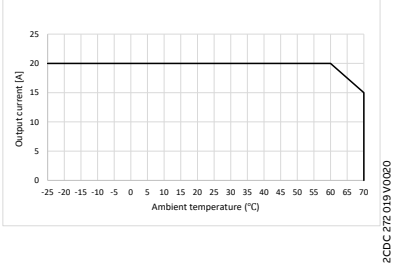
CP-S.1 24/3.0



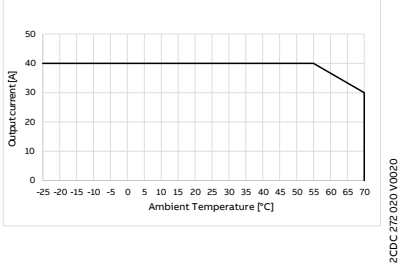
CP-S.1 24/5.0



CP-S.1 24/10.0



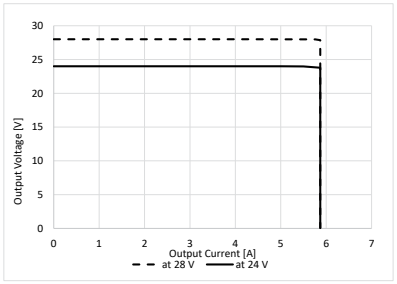
CP-S.1 24/20.0



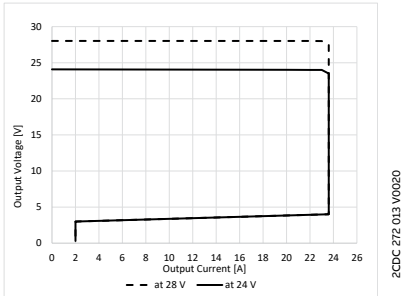
CP-S.1 24/40.0

CP-S power supplies
Technical diagrams

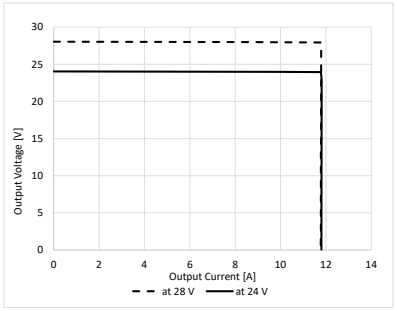
CP-S.3
U/I CHARACTERISTIC CURVES OF OUTPUT AT T_A = 25 °C



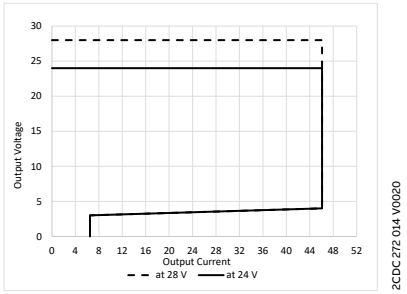
CP-S.3 24/5.0



CP-S.3 24/20.0

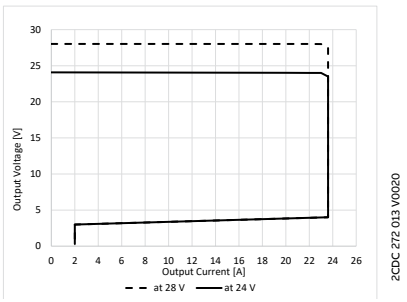


CP-S.3 24/10.0



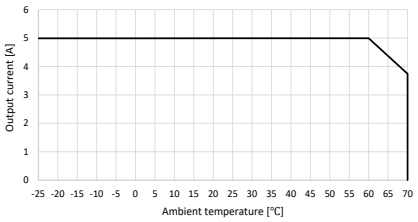
CP-S.3 24/40.0

CP-S.DC
U/I CHARACTERISTIC CURVES OF OUTPUT AT T_A = 25 °C

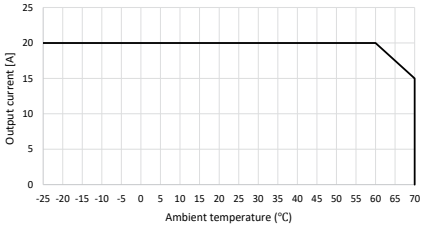


CP-S.DC 24/20.0

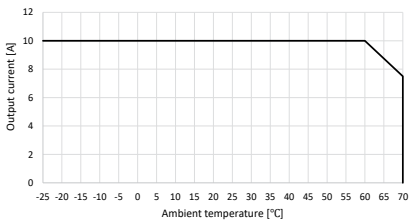
CP-S.3
CHARACTERISTIC CURVES OF TEMPERATURE U_{OUT} = 24 V DC



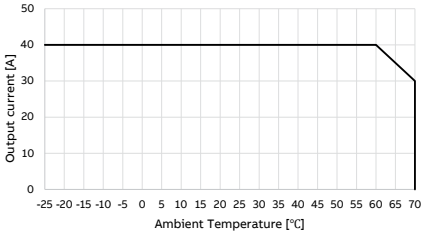
CP-S.3 24/5.0



CP-S.3 24/20.0

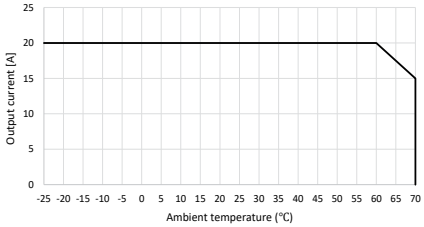


CP-S.3 24/10.0



CP-S.3 24/40.0

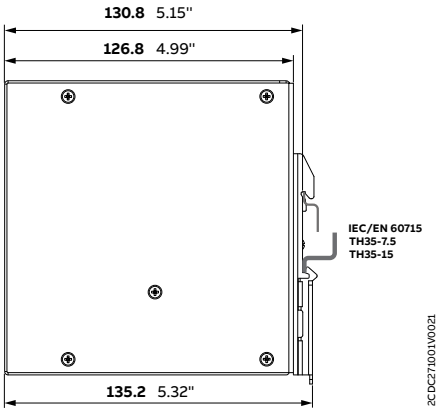
CP-S.DC
CHARACTERISTIC CURVES OF TEMPERATURE U_{OUT} = 24 V DC



CP-S.DC 24/20.0

CP-S power supplies
Dimensional drawings

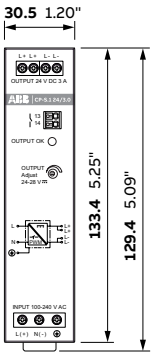
DIMENSIONAL DRAWINGS
in **mm** and inches



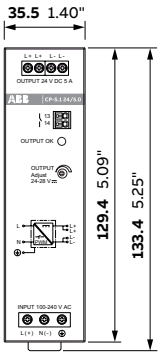
CP-S.1 24/3.0
CP-S.1 24/5.0
CP-S.1 24/10.0
CP-S.1 24/20.0
CP-S.1 24/40.0

CP-S.3 24/5.0
CP-S.3 24/10.0
CP-S.3 24/20.0
CP-S.3 24/40.0

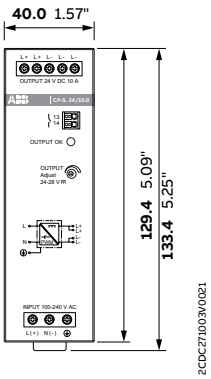
CP-S.DC 24/20.0



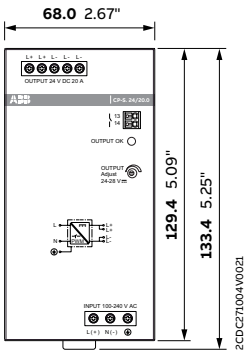
CP-S.1 24/3.0



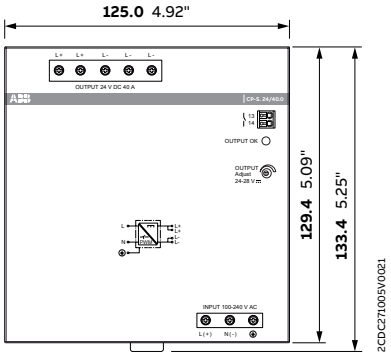
CP-S.1 24/5.0
CP-S.3 24/5.0



CP-S.1 24/10.0
CP-S.3 24/10.0



CP-S.1 24/20.0
CP-S.3 24/20.0
CP-S.DC 24/20.0



CP-S.1 24/40.0
CP-S.3 24/40.0


CP-E 24/20.0
OUTPUT 24 VDC 20.0A
INPUT 115-230 VAC
CP-E 24/10.0
OUTPUT 24 VDC 10.0A
CP-E 24/5.0
OUTPUT 24 VDC 5.0A
CP-E 43/1.25
OUTPUT 45 VDC 1.25A
CP-E 24/0.75
OUTPUT 24 VDC 0.75A
CP-E 12/2.5
OUTPUT 12 VDC 2.5A
CP-E 5/3.0
OUTPUT 5 VDC 3.0A
INPUT 100-240 VAC
ABB

STANDARD POWER SUPPLIES RANGE CP-E RANGE

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77 **Applications**
78 **Ordering details**
79 – 088 **Technical data**
89 – 091 **Technical diagrams**

CP-E RANGE

Benefits and advantages



ABB's CP-E range offers enhanced functionality and a simpler, more rational selection process. All power supply units can be operated at an ambient temperature of up to +70 °C (158 °F).

Affordable range
Products with exactly the functions you require. Designed for best possible price-performance ratio.

Global availability
The product can be used in any installations in the world. Giving you the confidence of worldwide sourcing – no matter where you build, install or operate your equipment.

Speed aup your projects
Data available for common planning software: Less engineering time required.

CP-E RANGE

Benefits and advantages

Characteristics

- Output voltages 5 V, 12 V, 24 V, 48 V DC
- Adjustable output voltages
- Output currents 0.625 A / 0.75 A / 1.25 A / 2.5 A / 3 A / 5 A / 10 A / 20 A
- Power range 15 W, 18 W, 30 W, 60 W, 120 W, 240 W, 480 W
- High efficiency, up to 90 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- U/I characteristic curve on devices > 18 W (fold-forward behavior at overload – no switch-off)
- Redundancy units offering true redundancy
- LED(s) for status indication
- Signalling output/contact for output voltage OK
  - Transistor on 24 V devices > 18 W and < 120 W
  - Solid-state on 24 V devices ≥ 120 W
- Various approvals and marks

Main benefits

Signalling output / contact
The CP-E range 24 V devices > 18 W offer an output/contact for monitoring of the output voltage and remote diagnosis.

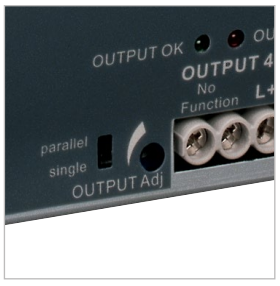
Wide range input
Optimized for world-wide applications: The CP-E power supplies can be supplied with a wide range of AC or DC voltages.

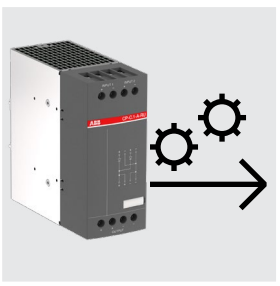
Adjustable output voltage
A continuously adjustable output voltage ensures optimal adaptation to the application, e.g. compensating the voltage drop caused by a long line length.

Redundancy units
For decoupling of parallelized power supply units ≤ 40 A. Thus, true redundancy can be achieved.









CP-E RANGE

Operation controls

OUTPUT Adjust:
Potentiometer - adjustment of output voltage

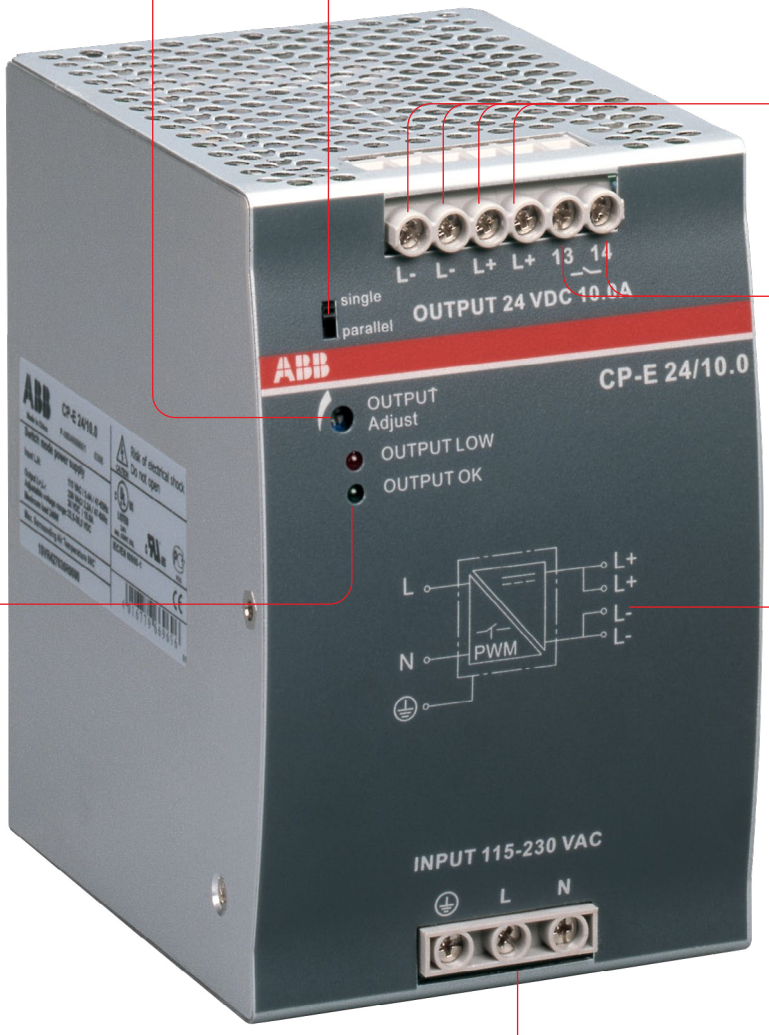
Single/parallel:
Sliding switch - adjustment of single or parallel operation

OUTPUT
L+, L+, L-, L-:
Terminals - output
5 V / 12 V / 24 V / 48 V

13-14:
Terminals - signalling contact (or solid-state)

Circuit diagram

Indication of operational states:
OUTPUT OK:
green LED - output voltage OK
OUTPUT LOW:
red LED - output voltage too low



INPUT L, N, PE: terminals - input
90-132 V AC, 180-265 V AC / 210-375 V DC
90-264 V AC / 120-375 V DC
85-264 V AC / 90-375 V DC

CP-E RANGE

Applications

Tooling machines

Packaging industry

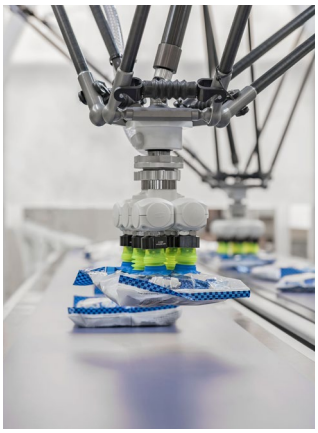
Food industry

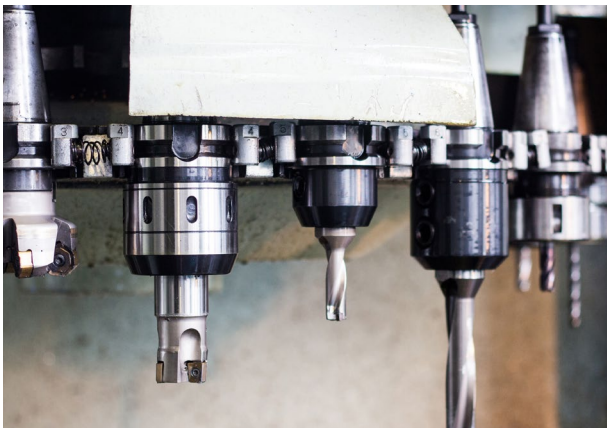
Textile industry

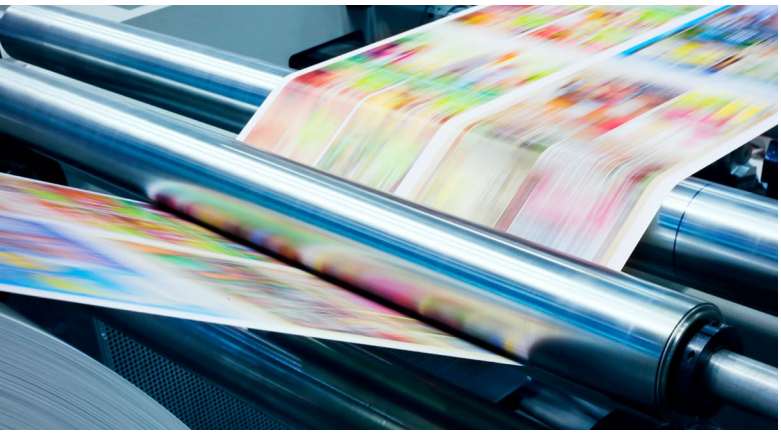
Printing industry

Electro-mobility













CP-E range
Ordering details


2CDC 271 017 F0006

CP-E 5/3.0


2CDC 271 013 F0006

CP-E 12/2.5


2CDC 271 028 F0008

CP-E 48/5.0


2CDC 271 027 F0008

CP-E 24/20.0

Description

This range offers types with output voltages from 5 V DC to 48 V DC at output currents of 0.625 A to 20 A. With their high thermal efficiency of up to 90 %, these power supplies have very low power and heat dissipation and can be operated without forced cooling. The functionality has been enhanced while the number of different types has been considerably reduced.

Of course, all power supplies of the CP-E range are approved in accordance with all relevant international standards.

ORDERING DETAILS - CP-E < 100 W

Input voltage range	Rated output voltage / current	Type	Order code	Weight (1 pc.) kg (lb)
90-264 V AC / 120-375 V DC	5 V DC / 3 A	CP-E 5/3.0	1SVR427033R3000	0.15 (0.33)
85-264 V AC / 90-375 V DC	12 V DC / 2.5 A	CP-E 12/2.5	1SVR427032R1000	0.29 (0.64)
90-132 V AC, 180-264 V AC / 210-375 V DC	12 V DC / 10 A	CP-E 12/10.0	1SVR427035R1000	1.00 (2.20)
90-264 V AC / 120-375 V DC	24 V DC / 0.75 A	CP-E 24/0.75	1SVR427030R0000	0.15 (0.33)
85-264 V AC / 90-375 V DC	24 V DC / 1.25 A	CP-E 24/1.25	1SVR427031R0000	0.29 (0.64)
85-264 V AC / 90-375 V DC	24 V DC / 2.5 A	CP-E 24/2.5	1SVR427032R0000	0.36 (0.79)

ORDERING DETAILS - CP-E ≥ 120 W

Input voltage range	Rated output voltage / current	Type	Order code	Weight (1 pc.) kg (lb)
90-132 V AC, 180-264 V AC / 210-375 V DC	24 V DC / 5 A	CP-E 24/5.0	1SVR427034R0000	1.00 (2.20)
90-132 V AC, 180-264 V AC / 210-375 V DC	24 V DC / 10 A	CP-E 24/10.0	1SVR427035R0000	1.36 (3.01)
90-264 V AC / 120-375 V DC	24 V DC / 20 A	CP-E 24/20.0	1SVR427036R0000	1.90 (4.18)
85-264 V AC / 90-375 V DC	48 V DC / 0.625 A	CP-E 48/0.62	1SVR427030R2000	0.29 (0.64)
85-264 V AC / 90-375 V DC	48 V DC / 1.25 A	CP-E 48/1.25	1SVR427031R2000	0.36 (0.79)
90-132 V AC, 180-264 V AC / 210-375 V DC	48 V DC / 5 A	CP-E 48/5.0	1SVR427034R2000	1.36 (3.01)
90-264 V AC / 120-375 V DC	48 V DC / 10 A	CP-E 48/10.0	1SVR427035R2000	1.90 (4.19)

CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-E 5/3.0	CP-E 12/2.5	CP-E 12/10.0
Input circuit				**L, N**
Rated input voltage U_{in}			100-240 V AC	115 / 230 V AC auto select
Input voltage range		90-264 V AC / 120-375 V DC	85-264 V AC / 90-375 V DC	90-132 V AC, 180-264 V AC / 210-375 V DC
Frequency range AC				47-63 Hz
Typical input current	at 115 V AC	335 mA	560 mA	2.2 A
	at 230 V AC	210 mA	330 mA	0.83 A
Typical power consumption		19.8 W	35.9 W	143 W
Inrush current	at 115 V AC	15 A	20 A	24 A
	at 230 V AC	30 A	40 A	48 A
Discharge current	input / output			0.25 mA
	input / PE			3.5 mA
Power failure buffering time	at 115 V AC	min. 20 ms	min. 20 ms	min. 25 ms
	at 230 V AC	min. 75 ms	min. 30 ms	min. 30 ms
Internal input fuse			2 A slow-acting / 250 V AC	3.15 A slow-acting / 250 V AC
Power factor correction (PFC)			no	yes, passive, 0.7
Indication of operational states				
Output voltage	green LED	OK: ⎍: output voltage OK	OUTPUT OK: ⎍: output voltage OK	OUTPUT OK: ⎍: output voltage OK
	red LED	LOW: ⎍: output voltage too low	-	OUTPUT LOW: ⎍: output voltage too low
Output circuit		**L+,L-**		**L+, L+, L-, L-**
Rated output voltage		5 V DC		12 V DC
Tolerance of the output voltage				0...+1 %
Adjustment range of the output voltage		4.5-5.75 V DC	12-14 V DC	11.4-14.5 V DC
Rated output power		15 W	30 W	120 W
Rated output current I_r	$T_a \leq 60$ °C	3.0 A	2.5 A	10 A
Derating of the output current	60 °C < $T_a \leq$ 70 °C	2.5 %/°C		2.5 %/°C
Maximum deviation with	load change statical	±2 %	±0.5 %	±1 % (single mode) ±5 % (parallel mode)
	change of output voltage within the input voltage range	±1 %	±0.5 %	±0.5 %
Recovery time T_R				< 2 ms
Starting time after applying the supply voltage	at I_r			max. 1 s
	with 3500 µF	—	max. 2 s	—
	with 7000 µF	max. 1.5 s	—	max. 1.5 s
Rise time	at rated load			max. 150 ms
	with 3500 µF	—	max. 500 ms	—
	with 7000 µF	max. 500 ms	—	max. 500 ms
Fall time				max. 150 ms
Residual ripple and switching peaks	BW = 20 MHz			50 mV
Parallel connection			yes, to enable redundancy	configurable, to increase power, up to 3 devices, min. 0.1 I_r - max. 0.9 I_r
Series connection			yes, to increase voltage	yes, to increase voltage, max. 2 devices
Resistance to reverse feed		1 s - max. 7.5 V DC	1 s - max.18 V DC	max. 18 V DC
Output circuit - No-load, overload and short-circuit behavior				
Characteristic curve of output		hiccup-mode		U/I characteristic curve
Short-circuit protection				continuous short-circuit proof
Short-circuit behavior		hiccup-mode		continuation with output power limiting
Overload protection				output power limiting
No-load protection				continuous no-load stability
Starting of capacitive loads		7000 µF	3500 µF	7000 µF

CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type			CP-E 5/3.0	CP-E 12/2.5	CP-E 12/10.0
General data					
Power loss			typ. 5 W	typ. 5.6 W	typ. 24 W
Efficiency			typ. 75 %	typ. 84 %	typ. 84 %
Duty cycle					100 %
Dimensions					see “Dimensional drawings”
Material of housing				plastic	metal
Mounting				DIN rail (IEC/EN 60715), snap-on mounting without any tool	
Mounting position					horizontal
Minimum distance to other units	horizontal / vertical			25 mm / 25 mm (0.98 in / 0.98 in)	
Degree of protection	housing / terminals			IP20 / IP20	
Protection class					I
Electrical connection - input circuit / output circuit					
Connecting capacity	fine-strand with wire end ferrule				0.2-4 mm² (24-11 AWG)
	fine-strand without wire end ferrule			0.2-2.5 mm² (24-14 AWG)	0.2-6 mm² (24-10 AWG)
	rigid				
Stripping length				6 mm (0.24 in)	8 mm (0.31 in)
Tightening torque	input / output			0.6 Nm (5 lb.in)	1.0 Nm (9 lb.in) / 0.62 Nm (5.5 lb.in)
Environmental data					
Ambient temperature range		operation	-20…+70 °C	-40…+70 °C	-35…+70 °C
		rated load	-20...+60 °C	-40...+60 °C	-35...+60 °C
		storage	-20…+85 °C	-40…+85 °C	-40…+85 °C
Damp heat				95 % RH, without condensation	
Vibration (sinusoidal) (IEC/EN 60068-2-6)				10-500 Hz, 2 G, along X, Y, Z each axis, 60 min. for each axis	
Shock (half-sine) (IEC/EN 60068-2-27)				15 G, 11 ms, 3 axes, 6 faces, 3 times for each face	
Isolation data					
Rated insulation voltage U_i	input circuit / output circuit			3 kV AC	
	input / PE			1.5 kV AC	
	output / PE			0.5 kV AC / 0.71 kV DC	
Pollution degree				2	
Overvoltage category				II	
Standards / Directives					
Standards				IEC/EN62368-1	
Low Voltage Directive				2014/35/EU	
EMC Directive				2014/30/EU	
RoHS Directive				2011/65/EU	
Protective low voltage				SELV (IEC60950-1)	
Electromagnetic compatibility					
Interference immunity to				IEC/EN 61000-6-2	
electrostatic discharge	IEC/EN 61000-4-2			level 4 (air discharge 15 kV / contact discharge 8 kV)	
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3			level 3 (10 V/m)	
electrical fast transient/burst	IEC/EN 61000-4-4		level 4 (4 kV / 2.5 kHz)	level 4 (4 kV / 5 kHz)	
surge	IEC/EN 61000-4-5			L-L level 3 (2 kV) / L-PE level 4 (4 kV)	
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6			level 3 (10 V)	
power frequency magnetic fields	IEC/EN 61000-4-8			level 4 (30 A/m)	
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11			dip: >95 % 10 ms / >30 % 500 ms interruptions: >95 % 5000 ms	
Interference emission				IEC/EN 61000-6-3	
high-frequency radiated				class B	
high-frequency conducted				class B	
limits for harmonic current emissions	IEC/EN 61000-3-2		class D	class A	class D

CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-E 24/0.75	CP-E 24/1.25	CP-E 24/2.5
Input circuit				**L, N**
Rated input voltage U_{in}				100-240 V AC
Input voltage range		90-264 V AC / 120-375 V DC		85-264 V AC / 90-375 V DC
Frequency range AC				47-63 Hz
Typical input current	at 115 V AC	335 mA	560 mA	1060 mA
	at 230 V AC	210 mA	330 mA	590 mA
Typical power consumption		22.8 W	36.7 W	69.2 W
Inrush current	at 115 V AC	15 A	20 A (max. 3 ms)	30 A
	at 230 V AC	30 A	40 A (max. 3 ms)	60 A
Discharge current	input / output			0.25 mA
	input / PE			3.5 mA
Power failure buffering time	at 115 V AC	min. 20 ms		min. 20 ms
	at 230 V AC	min. 75 ms		min. 30 ms
Internal input fuse				2 A slow-acting / 250 V AC
Power factor correction (PFC)				no
Indication of operational states				
Output voltage	green LED	OK: ⎍: output voltage OK	OUTPUT OK: ⎍: output voltage OK	
	red LED	LOW: ⎍: output voltage too low	—	—
Output circuit		**L+,L-**		**L+, L+, L-, L-**
Rated output voltage				24 V DC
Tolerance of the output voltage				0 ... +1 %
Adjustment range of the output voltage		21.6-28.8 V DC		24-28 V DC
Rated output power		18 W	30 W	60 W
Rated output current I_r	$T_a \leq 60$ °C	0.75 A	1.25 A	2.5 A
Derating of the output current	60 °C < $T_a \leq$ 70 °C			2.5 %/°C
Signalling output for output voltage OK	DC OK	—		transistor
Maximum deviation with	load change statical	±2 %		±0.5 %
	change of output voltage within the input voltage range	±1 %		±0.5 %
Recovery time T_R				< 2 ms
Starting time after applying the supply voltage	at I_r			max. 1 s
	with 3500 µF	—	max. 2 s	—
	with 7000 µF	max. 1.5 s	—	max. 1.5 s
Rise time	at rated load			max. 150 ms
	with 3500 µF	—	max. 500 ms	—
	with 7000 µF	max. 500 ms	—	max. 500 ms
Fall time				max. 150 ms
Residual ripple and switching peaks	BW = 20 MHz			50 mV
Parallel connection				yes, to enable redundancy
Series connection				yes, to increase voltage
Resistance to reverse feed				1 s - max. 35 V DC
Output circuit - No-load, overload and short-circuit behavior				
Characteristic curve of output		hiccup-mode		U/I characteristic curve
Short-circuit protection				continuous short-circuit proof
Short-circuit behavior		hiccup-mode		continuation with output power limiting
Overload protection				output power limiting
No-load protection				continuous no-load stability
Starting of capacitive loads		7000 µF	3500 µF	7000 µF

CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-E 24/0.75	CP-E 24/1.25	CP-E 24/2.5
General data				
Power loss		typ. 4.45 W	typ. 5.5 W	typ. 8.8 W
Efficiency		typ. 77 %	typ. 86 %	typ. 89 %
Duty cycle				100 %
Dimensions				see “Dimensional drawings”
Material of housing				plastic
Mounting				DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position				horizontal
Minimum distance to other units	horizontal / vertical			25 mm / 25 mm (0.98 in / 0.98 in)
Degree of protection	housing / terminals			IP20 / IP20
Protection class				I
Electrical connection - input circuit / output circuit				
Connecting capacity	fine-strand with wire end ferrule			0.2-2.5 mm² (24-14 AWG)
	fine-strand without wire end ferrule			
	rigid			
Stripping length				6 mm (0.24 in)
Tightening torque	input / output			0.6 Nm (5 lb.in)
Environmental data				
Ambient temperature range	operation	-20…+70 °C		-40…+70 °C
	rated load	-20…+60 °C		-40…+60 °C
	storage	-20…+85 °C		-40…+85 °C
Damp heat (cyclic) (IEC/EN 60068-2-30)				95 % RH, without condensation
Vibration (sinusoidal) (IEC/EN 60068-2-6)				10-500 Hz, 2 G, along X, Y, Z each axis, 60 min. for each axis
Shock (half-sine) (IEC/EN 60068-2-27)				15 G, 11 ms, 3 axes, 6 faces, 3 times for each face
Isolation data				
Rated insulation voltage U_i	input circuit / output circuit			3 kV AC
	input / PE			1.5 kV AC
	output / PE			0.5 kV AC; 0.71 kV DC
Pollution degree				2
Overvoltage category				II
Standards / Directives				
Standards				IEC/EN62368-1
Low Voltage Directive				2014/35/EU
EMC Directive				2014/30/EU
RoHS Directive				2011/65/EU
Protective low voltage				SELV (IEC60950-1)
Electromagnetic compatibility				
Interference immunity to				IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2			level 4 (air discharge 15 kV / contact discharge 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3			level 3 (10 V/m)
electrical fast transient/burst	IEC/EN 61000-4-4	level 4 (4 kV / 2.5 kHz)		level 4 (4 kV / 5 kHz)
surge	IEC/EN 61000-4-5			L-L level 3 (2 kV) / L-PE level 4 (4 kV)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6			level 3 (10 V)
power frequency magnetic fields	IEC/EN 61000-4-8			level 4 (30 A/m)
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11			dip: >95 % 10 ms / >30 % 500 ms, interruptions: >95 % 5000 ms
Interference emission				IEC/EN 61000-6-3
high-frequency radiated				class B
high-frequency conducted				class B
limits for harmonic current emissions	IEC/EN 61000-3-2	class D		class A

CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-E 24/5.0	CP-E 24/10.0	CP-E 24/20.0
Input circuit				**L, N**
Rated input voltage U_{in}			115 / 230 V AC auto select	115-230 V AC
Input voltage range		90-132 V AC, 180-264 V AC / 210-375 V DC	90-132 V AC, 180-264 V AC / 210-375 V DC	90-264 V AC / 120-375 V DC
Frequency range AC				47-63 Hz
Typical input current	at 115 V AC	2.2 A	4.0 A	4.9 A
	at 230 V AC	0.83 A	1.55 A	2.5 A
Typical power consumption		140 W	270 W	539 W
Inrush current	at 115 V AC	24 A (max. 5 ms)	30 A (max. 5 ms)	25 A (max. 5 ms)
	at 230 V AC	48 A (max. 5 ms)	60 A (max. 5 ms)	50 A (max. 5 ms)
Discharge current	input / output			0.25 mA
	input / PE			3.5 mA
Power failure buffering time	at 115 V AC			min. 25 ms
	at 230 V AC			min. 30 ms
Internal input fuse		3.15 A slow-acting / 250 V AC	6.3 A slow-acting / 250 V AC	10 A slow-acting / 250 V AC
Power factor correction (PFC)		yes, passive, 0.7	yes, passive, 0.75	yes, active 115 V AC: 0.99 230 V AC: 0.97
Indication of operational states				
Output voltage	green LED			OUTPUT OK: ⎍: output voltage OK
	red LED			OUTPUT LOW: ⎍: output voltage too low
Output circuit				**L+, L+, L-, L-**
Rated output voltage				24 V DC
Tolerance of the output voltage				0...+1 %
Adjustment range of the output voltage				22.5-28.5 V DC
Rated output power		120 W	240 W	480 W
Rated output current I_r	$T_a \leq 60$ °C	5 A	10 A	—
	$T_a \leq 55$ °C	—	—	20 A
Derating of the output current	60 °C < $T_a \leq$ 70 °C		2.5 %/°C	—
	55 °C < $T_a \leq$ 70 °C	—	—	2.5 %/°C
Signalling contact for output voltage OK	13-14			solid-state (max. 60 V DC, 0.3 A)
Minimum fuse rating to achieve short-circuit protection	13-14			≥ 60 V DC, ≤ 0.3 A fast-acting
Maximum deviation with	load change statical			±1 % (single mode), ±5 % (parallel mode)
	change of output voltage within the input voltage range			±0.5 %
Recovery time T_R				< 2 ms
Starting time after applying the supply voltage	at I_r	max. 1 s	2.5 s (at -40 °C / 90 V AC starting time >2.5 s has to be expected)	max. 1 s
	with 3500 µF	max. 1.5 s	—	—
	with 7000 µF	—	2.5 s	max. 1.5 s
Rise time	at rated load			max. 150 ms
	with 3500 µF	max. 500 ms	—	—
	with 7000 µF	—		max. 500 ms
Fall time				max. 150 ms
Residual ripple and switching peaks	BW = 20 MHz	50 mV		100 mV
Parallel connection		configurable, to increase power, up to 3 devices, min. 0.1 I_r - max. 0.9 I_r		
Series connection		yes, to increase voltage, max. 2 devices		
Resistance to reverse feed				max. 35 V DC

CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-E 24/5.0	CP-E 24/10.0	CP-E 24/20.0
Output circuit - No-load, overload and short-circuit behavior				
Characteristic curve of output				U/I characteristic curve
Short-circuit protection				continuous short-circuit proof
Short-circuit behavior				continuation with output power limiting
Overload protection				output power limiting
No-load protection				continuous no-load stability
Starting of capacitive loads		3500 µF		7000 µF
General data				
Power loss		typ. 20 W	typ. 35 W	typ. 63 W
Efficiency		typ. 86 %	typ. 89 %	typ. 89 %
Duty cycle				100 %
Dimensions				see “Dimensional drawings”
Material of housing				metal
Mounting				DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position				horizontal
Minimum distance to other units	horizontal / vertical			25 mm / 25 mm (0.98 in / 0.98 in)
Degree of protection	housing / terminals			IP20 / IP20
Protection class				I
Electrical connection - input circuit / output circuit				
Connecting capacity	fine-strand with wire end ferrule			0.2-4 mm² (24-11 AWG)
	fine-strand without wire end ferrule			0.2-6 mm² (24-10 AWG)
	rigid			
Stripping length				8 mm (0.31 in)
Tightening torque	input / output			1.0 Nm (9 lb.in) / 0.62 Nm (5.5 lb.in)
Environmental data				
Ambient temperature range	operation	-35…+70 °C		-40…+70 °C
	rated load	-35…+60 °C	-40…+60 °C	-40…+55 °C
	storage	-40…+85 °C		-40…+85 °C
Damp heat (cyclic) (IEC/EN 60068-2-30)				95 % RH, without condensation
Vibration (sinusoidal) (IEC/EN 60068-2-6)				10-500 Hz, 2 G, along X, Y, Z each axis, 60 min. for each axis
Shock (half-sine) (IEC/EN 60068-2-27)				15 G, 11 ms, 3 axes, 6 faces, 3 times for each face
Isolation data				
Rated insulation voltage U_i	input circuit / output circuit			3 kV AC
	input / PE			1.5 kV AC
	output / PE			0.5 kV AC; 0.71 kV DC
	signalling contact / PE			0.5 kV DC
Pollution degree				2
Overvoltage category				II
Standards / Directives				
Standards				IEC/EN 62368-1
Low Voltage Directive				2014/35/EU
EMC Directive				2014/30/EU
RoHS Directive				2011/65/EU
Protective low voltage				SELV (IEC60950-1)

CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-E 24/5.0	CP-E 24/10.0	CP-E 24/20.0
Electromagnetic compatibility				
Interference immunity to				IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2			level 4 (air discharge 15 kV / contact discharge 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3			level 3 (10 V/m)
electrical fast transient/burst	IEC/EN 61000-4-4	level 4 (4 kV / 5 kHz)		level 4 (4 kV / 2.5 kHz)
surge	IEC/EN 61000-4-5			L-L level 3 (2 kV) / L-PE level 4 (4 kV)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6			level 3 (10 V)
power frequency magnetic fields	IEC/EN 61000-4-8			level 4 (30 A/m)
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11			dip: >95 % 10 ms / >30 % 500 ms interruptions: >95 % 5000 ms
Interference emission				IEC/EN 61000-6-3
high-frequency radiated	IEC/CISPR 22, EN 55022			class B
high-frequency conducted	IEC/CISPR 22, EN 55022			class B
limits for harmonic current emissions	IEC/EN 61000-3-2			class D

CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-E 48/0.62	CP-E 48/1.25	CP-E 48/5.0	CP-E 48/10.0
Input circuit					**L, N**
Rated input voltage U_{in}			100-240 V AC	115 / 230 V AC auto select	115-230 V AC
Input voltage range			85-264 V AC / 90-375 V DC	90-132 V AC, 180-264 V AC / 210-375 V DC	90-264 V AC / 120-375 V DC
Frequency range AC					47-63 Hz
Typical input current	at 115 V AC	560 mA	1060 mA	4.0 A	4.9 A
	at 230 V AC	330 mA	590 mA	1.55 A	2.5 A
Typical power consumption		35.7 W	69.0 W	267 W	528 W
Inrush current	at 115 V AC	20 A	30 A	30 A (max. 5 ms)	25 A (max. 5 ms)
	at 230 V AC	40 A	60 A	60 A (max. 5 ms)	50 A (max. 5 ms)
Discharge current	input / output				0.25 mA
	input / PE				3.5 mA
Power failure buffering time	at 115 V AC		min. 20 ms	min. 25 ms	min. 25 ms
	at 230 V AC				min. 30 ms
Internal input fuse			2 A slow-acting / 250 V AC	6.3 A slow-acting / 250 V AC	10 A slow-acting / 250 V AC
Power factor correction (PFC)			no	yes, passive, 0.7	yes, active 115 V AC: 0.99 230 V AC: 0.97
Indication of operational states					
Output voltage	green LED			OUTPUT OK: ⎍: output voltage OK	
	red LED	—	—	OUTPUT LOW: ⎍: output voltage too low	
Output circuit					**L+, L+, L-, L-**
Rated output voltage					48 V DC
Tolerance of the output voltage					0...+1 %
Adjustment range of the output voltage			48-55 V DC		47-56 V DC
Rated output power		30 W	60 W	240 W	480 W
Rated output current I_r	$T_a \leq 60$ °C	0.625 A	1.25 A	5 A	-
	$T_a \leq 55$ °C	—	—	—	10 A
Derating of the output current	60 °C < $T_a \leq 70$ °C			2.5 %/°C	-
	55 °C < $T_a \leq 70$ °C	—	—	—	2.5 %/°C
Signalling output for output voltage OK	DC OK	—	—	—	—
Maximum deviation with	load change statical		±0.5 %		±1 % (single mode) ±5 % (parallel mode)
	change of output voltage within the input voltage range		±0.5 %		±0.5 %
Recovery time T_R					< 2 ms
Starting time after applying the supply voltage	at I_r				max. 1 s
	with 3500 µF	max. 2 s	—	—	—
	with 7000 µF	—	max. 1.5 s		max. 1.5 s
Rise time	at rated load				max. 150 ms
	with 3500 µF	max. 500 ms	—	—	—
	with 7000 µF	—	max. 500 ms		max. 500 ms
Fall time					max. 150 ms
Residual ripple and switching peaks	BW = 20 MHz		50 mV		100 mV
Parallel connection			yes, to enable redundancy		configurable, to increase power, up to 3 devices, min. 0.1 I_r - max. 0.9 I_r
Series connection			yes, to increase voltage		yes, to increase voltage, max. 2 devices
Resistance to reverse feed					1 s - max. 63 V DC

CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-E 48/0.62	CP-E 48/1.25	CP-E 48/5.0	CP-E 48/10.0
Output circuit - No-load, overload and short-circuit behavior					
Characteristic curve of output					U/I characteristic curve
Short-circuit protection					continuous short-circuit proof
Short-circuit behavior					continuation with output power limiting
Overload protection					output power limiting
No-load protection					continuous no-load stability
Starting of capacitive loads		3500 µF	7000 µF	unlimited	7000 µF
General data					
Power loss		typ. 4.9 W	typ. 7.8 W	typ. 32 W	typ. 60 W
Efficiency		typ. 86 %	typ. 89 %		typ. 90 %
Duty cycle					100 %
Dimensions					see “Dimensional drawings”
Material of housing			plastic		metal
Mounting				DIN rail (IEC/EN 60715), snap-on mounting without any tool	
Mounting position					horizontal
Minimum distance to other units	horizontal / vertical				25 mm / 25 mm (0.98 in / 0.98 in)
Degree of protection	housing / terminals				IP/20 / IP20
Protection class					I
Electrical connection - input circuit / output circuit					
Connecting capacity	fine-strand with wire end ferrule	0.2-2.5 mm² (24-14 AWG)		0.2-4 mm² (24-11 AWG)	
	fine-strand without wire end ferrule			0.2-6 mm² (24-10 AWG)	
	rigid				
Stripping length			6 mm (0.24 in)		8 mm (0.31 in)
Tightening torque	input / output		0.6 Nm (5 lb.in)		1.0 Nm (9 lb.in) / 0.62 Nm (5.5 lb.in)
Environmental data					
Ambient temperature range	operation				-40…+70 °C
	rated load			-40…+60 °C	-40…+55 °C
	storage				-40…+85 °C
Damp heat (cyclic) (IEC/EN 60068-2-30)					95 % RH, without condensation
Vibration (sinusoidal) (IEC/EN 60068-2-6)					10-500 Hz, 2 G, along X, Y, Z each axis, 60 min. for each axis
Shock (half-sine) (IEC/EN 60068-2-27)					15 G, 11 ms, 3 axes, 6 faces, 3 times for each face
Isolation data					
Rated insulation voltage U_i	input circuit / output circuit				3 kV AC
	input / PE				1.5 kV AC
	output / PE				0.5 kV AC; 0.71 kV DC
Pollution degree					2
Overvoltage category					II
Standards / Directives					
Standards					IEC/EN 62368-1
Low Voltage Directive					2014/35/EU
EMC Directive					2014/30/EU
RoHS Directive					2011/65/EU
Protective low voltage					SELV (IEC60950-1)

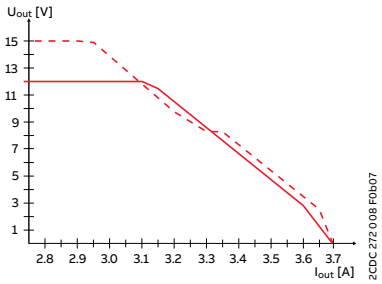
CP-E range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

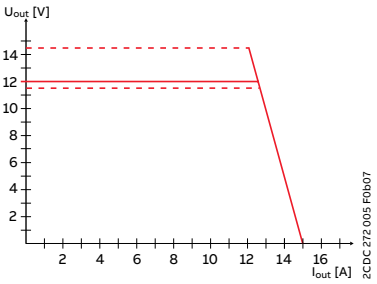
Type		CP-E 48/0.62	CP-E 48/1.25	CP-E 48/5.0	CP-E 48/10.0
Electromagnetic compatibility					
Interference immunity to		IEC/EN 61000-6-2			
electrostatic discharge	IEC/EN 61000-4-2	level 4 (air discharge 15 kV / contact discharge 8 kV)			
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	level 3 (10 V/m)			
electrical fast transient/burst	IEC/EN 61000-4-4	level 4 (4 kV / 5 kHz)		level 4 (4 kV / 2.5 kHz)	
surge	IEC/EN 61000-4-5	L-L level 3 (2 kV) / L-PE level 4 (4 kV)			
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3 (10 V/m)			
power frequency magnetic fields	IEC/EN 61000-4-8	level 4 (30 A/m)			
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	dip: >95 % 10 ms / >30 % 500 ms, interruptions: >95 % 5000 ms			
Interference emission		IEC/EN 61000-6-3			
high-frequency radiated	IEC/CISPR 22, EN 55022	class B			
high-frequency conducted	IEC/CISPR 22, EN 55022	class B			
limits for harmonic current emissions	IEC/EN 61000-3-2	class A		class D	

CP-E range
Technical diagrams

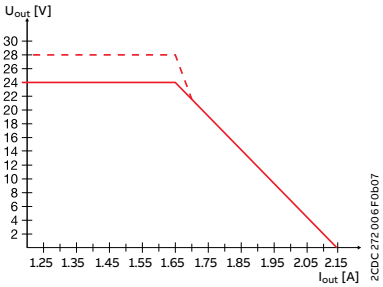
OUTPUT CURVE AT T_A = 25 °C



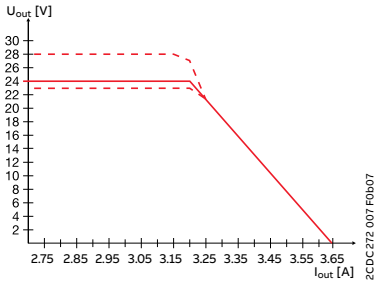
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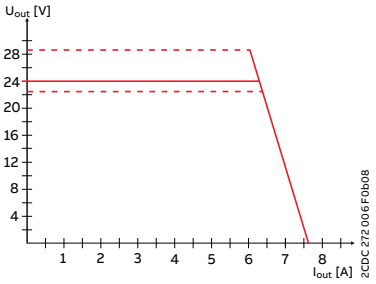
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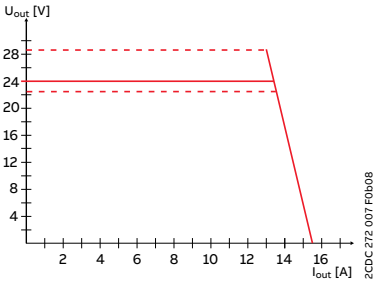
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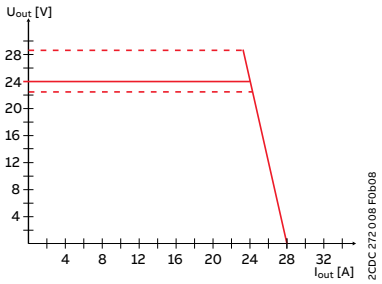
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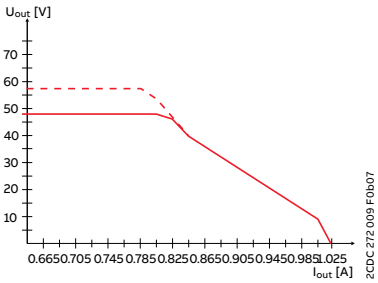
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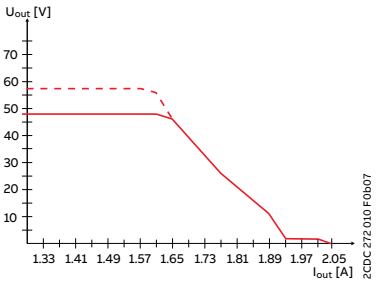
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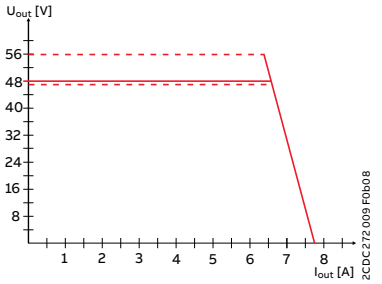
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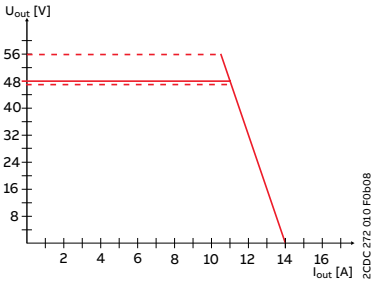
CP-E 48/0.62



CP-E 48/1.25



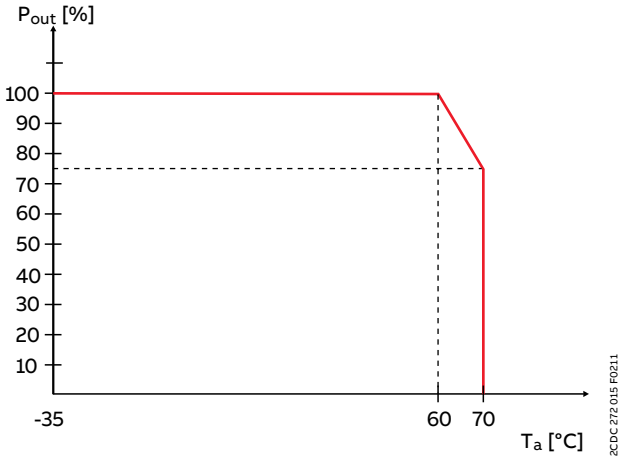
CP-E 48/5.0



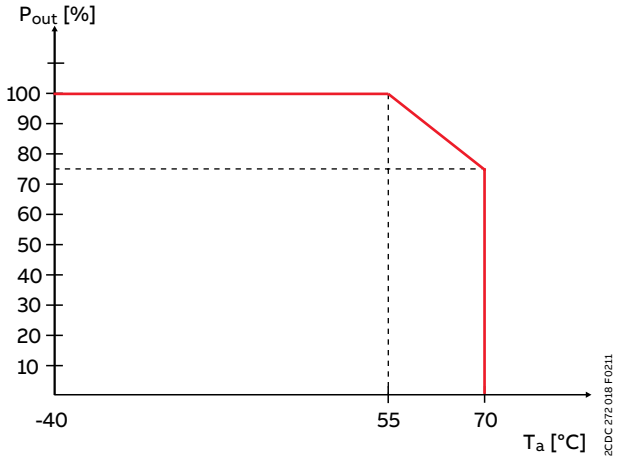
CP-E 48/10.0

CP-E range
Technical diagrams

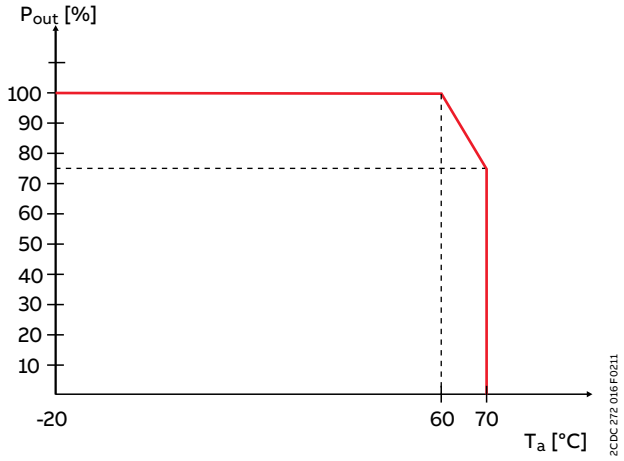
TEMPERATURE BEHAVIOR



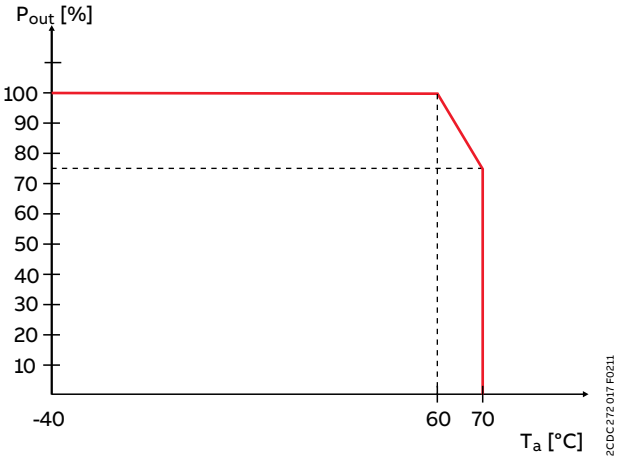
CP-E 12/10.0, CP-E 24/5.0



CP-E 24/20.0, CP-E 48/10.0



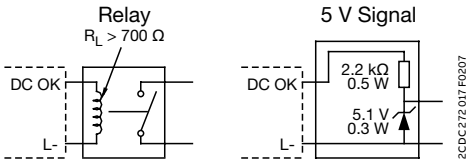
CP-E 5/3.0, CP-E 24/0.75



CP-E 12/2.5, CP-E 24/1.25, CP-E 48/0.62,
CP-E 24/2.5, CP-E 48/1.25, CP-E 24/10.0, CP-E 48/5.0

CP-E range
Technical diagrams

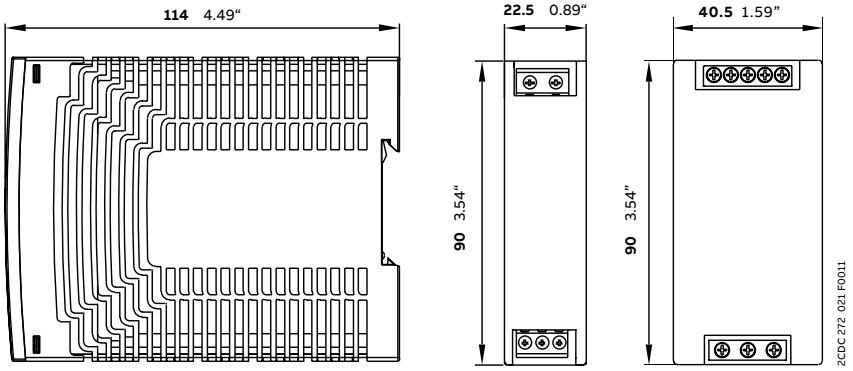
WIRING INSTRUCTIONS



CP-E 24/1.25, CP-E 24/2.5

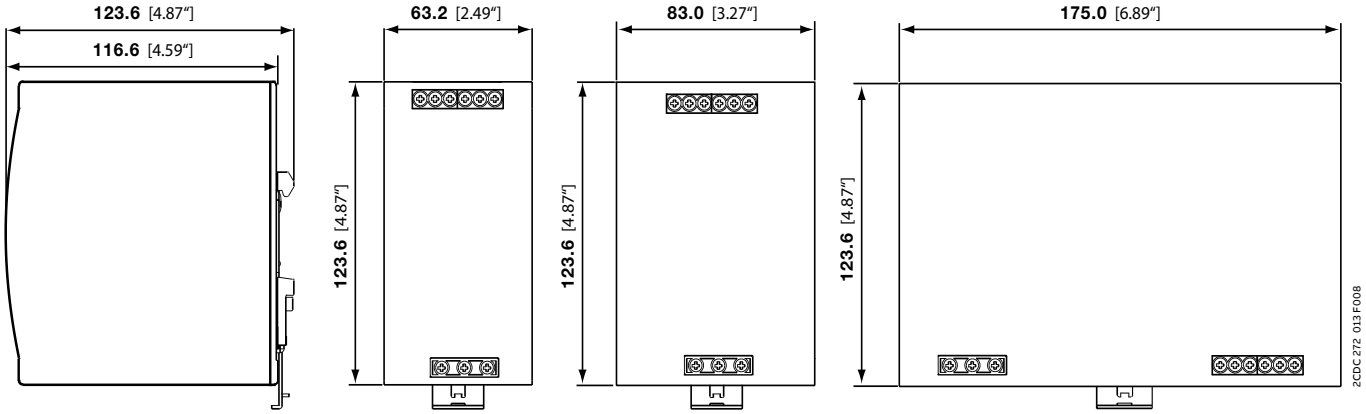
DIMENSIONAL DRAWINGS

Dimensions in **mm** and inches



CP-E 5/3.0,
CP-E 24/0.75

CP-E 12/2.5,
CP-E 24/1.25,
CP-E 24/2.5,
CP-E 48/0.62,
CP-E 48/1.25



CP-E 12/10.0,
CP-E 24/5.0

CP-E 24/10.0,
CP-E 48/5.0

CP-E 24/20.0,
CP-E 48/10.0


OUTPUT ADJ.
CP-D 12/0.83
CP-D 12/2.1
CP-D 24/2.5
CP-D 24/4.2
DC LOW
DC ON
L N

POWER SUPPLIES FOR BUILDING APPLICATIONS CP-D RANGE

094 – 095 **Benefits and advantages**
096 **Operation controls**
097 **Applications**
098 **Ordering details**
099 – 102 **Technical data**
103 – 104 **Technical diagrams**

CP-D RANGE

Benefits and advantages



Thanks to CP-D range's compact modular housing, it is ideal for building applications and installation. For maximum flexibility in operation, six different versions are available, from 10 W up to 100 W. Their wide input voltage range allows their use in global applications.

Easy to install
The CP-D range is easy to adjust and ideally suited for installation in distribution panels due to its width being only 18 to 90 mm.

Global availability
The product can be used in any installation in the world. Giving you the confidence of worldwide sourcing – no matter where you build, install or operate your equipment.

Speed up your projects
Data available for common planning software: Less engineering time required.

CP-D RANGE

Benefits and advantages

Characteristics

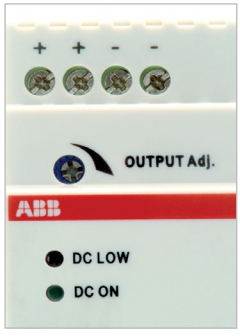
- Output voltages 12 V, 24 V DC
- Adjustable output voltages (devices > 10 W)
- Output currents 0.42 A / 0.83 A / 1.3 A / 2.1 A / 2.5 A / 4.2 A
- Power range 10 W, 25 W, 30 W, 60 W, 100 W
- Wide range input 100-240 V AC (90-264 V AC, 120-375 V DC)
- High efficiency of up to 89 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -40...+70 °C
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- LEDs for status indication
- Light-grey housing in RAL 7035
- Various approvals and marks

Main benefits

Adjustable output voltage
The CP-D range types > 10 W feature a continuously adjustable output voltage. Thus, they can be optimally adapted to the application, for example compensating the voltage drop caused by a long line length.

Wide range input
Optimized for world-wide applications: The CP-D power supplies can be supplied with 90-264 V AC or 120-375 V DC.

Width and structural form
With their width being only 18 to 90 mm, the CP-D range switch mode power supplies are ideally suited for installation in distribution panels.







CP-D RANGE

Operation controls

OUTPUT Adjust:
Potentiometer - adjustment of output voltage*)

OUTPUT ++/--:
Terminals - output
12 V, 24 V



Indication of operational states
DC ON: green LED - output voltage applied
DC LOW: red LED - output voltage too low

Circuit diagram

INPUT L, N: terminals - input
90 ... 264 V AC
120 ... 375 V DC

*) only for devices > 10 W. 12 V version: 12...14 V DC, 24 V version: 24 ... 28 V DC.

CP-D RANGE

Applications

Emergency lighting

Communication

Escalators

Elevators

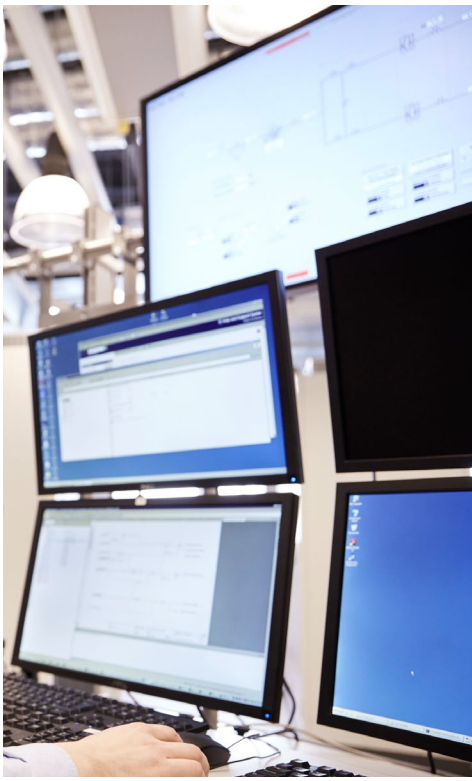
LED lighting

Venetian blind drives













CP-D range
Ordering details



CP-D 12/0.83, CP-D 24/0.42



CP-D 12/2.1, CP-D 24/1.3



CP-D 24/2.5

Description

The CP-D range of modular power supply units in MDRC (modular DIN rail components) design is ideally suited for installation in distribution panels. This range offers devices with output voltages of 12 V DC and 24 V DC at output currents of 0.42 A to 4.2 A. Thanks to their high thermal efficiency, these power supplies have very low power and heat dissipation and can be operated without forced cooling. All power supply units in the CP-D range are approved according to all relevant international standards.

ORDERING DETAILS

Input voltage range	Rated output voltage / current	Type	Order code	Weight (1 pc.) kg (lb)
90-264 V AC/ 120-375 V DC	12 V DC / 0.83 A	CP-D 12/0.83	1SVR427041R1000	0.06 (0.13)
90-264 V AC/ 120-375 V DC	12 V DC / 2.1 A	CP-D 12/2.1	1SVR427043R1200	0.19 (0.41)
90-264 V AC/ 120-375 V DC	24 V DC / 0.42 A	CP-D 24/0.42	1SVR427041R0000	0.06 (0.13)
90-264 V AC/ 120-375 V DC	24 V DC / 1.3 A	CP-D 24/1.3	1SVR427043R0100	0.19 (0.41)
90-264 V AC/ 120-375 V DC	24 V DC / 2.5 A	CP-D 24/2.5	1SVR427044R0200	0.25 (0.56)
90-264 V AC/ 120-375 V DC	24 V DC / 4.2 A	CP-D 24/4.2	1SVR427045R0400	0.32 (0.71)

CP-D range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-D 12/0.83	CP-D 12/2.1
Input circuit - supply circuit			**L, N**
Rated input voltage U_{in}			100-240 V AC
Input voltage range			90-264 V AC / 120-375 V DC
Frequency range AC			47-63 Hz
Typical input current / typical power consumption	at 115 V AC	200 mA / 12.68 W	502 mA / 31.14 W
	at 230 V AC	128.3 mA / 13.01 W	277 mA / 31.2 W
Inrush current	at 115 / 230 V AC	16 A / 32 A	25 A / 50 A
Power failure buffering time			min. 30 ms
Internal input fuse		1 A slow-acting / 250 V AC	2 A slow-acting / 250 V AC
Power factor correction (PFC)			no
Indication of operational states			
Output voltage	DC ON: green LED		⎍: output voltage applied
	DC LOW: red LED		⎍: output voltage too low
Output circuit		**+, -**	**++, --**
Rated output voltage			12 V DC
Tolerance of the output voltage			±1 %
Adjustment range of the output voltage	OUTPUT adjust	—	12-14 V DC
Rated output power		10 W	25 W
Rated output current I_r	$T_a \leq 60$ °C	0.83 A	2.1 A
Derating of the output current	60 °C < $T_a \leq$ 70 °C		2.5 %/°C
Maximum deviation with	load change statical		max. 1 %
	change of output voltage within the input voltage range		max. 1 %
Recover time T_A			< 1 ms
Starting time after applying the supply voltage	at I_r		1000 ms
Rise time	at rated load		typ. 1 ms
Residual ripple and switching peaks	BW = 20 MHz		50 mV
Parallel connection			yes, using CP-D RU
Series connection			yes, to increase voltage
Resistance to reverse feed			18 V / 1 s
Output circuit - No-load, overload and short-circuit behavior			
Characteristic curve of output		hiccup-mode	U/I characteristic curve
Short-circuit protection			continuous short-circuit stability
Short-circuit behavior			continuation with output power limiting
Current limiting at short circuit		typ. 1.4 A	typ. 5.9 A
Overload protection			output power limiting
Overvoltage protection			15-16.5 V DC
No-load protection			continuous no-load stability
Starting of capacitive loads			unlimited
General data			
Efficiency		typ. 78 %	typ. 82 %
Duty cycle			100 %
Dimensions			see “Dimensional drawings”
Weight	kg (lb)	0.06 (0.13)	0.19 (0.41)
Material of housing			plastic
Mounting			DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position			horizontal
Minimum distance to other units	horizontal / vertical		25 mm / 25 mm (0.98 in / 0.98 in)
Degree of protection	housing / terminals		IP20 / IP20
Protection class			II

CP-D range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-D 12/0.83	CP-D 12/2.1
Electrical connection - Input circuit / Output circuit			
Connecting capacity	fine-strand with wire end ferrule	0.2-1.5 mm² (24-16 AWG)	0.2-2.5 mm² (24-14 AWG)
	rigid	0.2-2.5 mm² (26-12 AWG)	0.2-2.5 mm² (24-12 AWG)
Stripping length		4-5 mm (0.16-0.2 in)	7 mm (0.28 in)
Tightening torque		0.6 Nm (5 lb.in)	0.7 Nm (6 lb.in)
Environmental data			
Ambient temperature range	operation	-40…+70 °C (-40...+158 °F)	
	rated load	-40…+60 °C (-40...+131 °F)	
	storage	-40…+85 °C (-40...+185 °F)	
Altitude during operation	IEC/EN 60068-2-13	max. 4850 m	
Damp heat (cyclic) (IEC/EN 60068-2-30)		4 x 24 cycles, 40 °C, 95 % RH	
Vibration (sinusoidal) (IEC/EN 60068-2-6)		50 m/s², 10 Hz - 2 kHz	
Shock (half-sine) (IEC/EN 60068-2-27)		40 m/s², 22 ms	
Isolation data			
Rated insulation voltage U_i	input circuit / output circuit	3 kV AC	
Pollution degree		2	
Overvoltage category		II	
Standards / Directives			
Standards		IEC/EN 62368-1	
Low Voltage Directive		2014/35/EU	
EMC Directive		2014/30/EU	
RoHS Directive		2011/65/EU	
Protective low voltage		SELV (IEC 60950-1)	
Electromagnetic compatibility			
Interference immunity to			IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	level 4 (4 kV / 8 kV)	level 4 (4 kV / 15 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3		level 3 (10 V/m)
electrical fast transient/burst	IEC/EN 61000-4-4		level 4 (4 kV)
surge	IEC/EN 61000-4-5		level 3 (2 kV L-L)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6		level 3 (10 V)
Interference emission			IEC/EN 61000-6-3
high-frequency radiated			class B
high-frequency conducted			class B

CP-D range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-D 24/0.42	CP-D 24/1.3	CP-D 24/2.5	CP-D 24/4.2
Input circuit - supply circuit					**L, N**
Rated input voltage U_{in}					100-240 V AC
Input voltage range					90-264 V AC /120-375 V DC
Frequency range AC					47-63 Hz
Typical input current / typical power consumption	at 115 V AC	184 mA / 11.62 W	600 mA / 37.92 W	1120 mA / 69.3 W	1800 mA / 117.3 W
	at 230 V AC	120.6 mA / 12 W	344 mA / 38.16 W	660 mA / 70.1 W	900 mA / 114.4 W
Inrush current	at 115 / 230 V AC	max. 16 A / 32 A	max. 25 A / 50 A		max. 30 A / 60 A
Power failure buffering time			min. 30 ms		min. 60 ms
Internal input fuse		1 A slow-acting / 250 V AC		2 A slow-acting / 250 V AC	3.15 A slow-acting / 250 V AC
Power factor correction (PFC)					no
Indication of operational states					
Output voltage	DC ON: green LED				⎍: output voltage applied
	DC LOW: red LED				⎍: output voltage too low
Output circuit			**+, -**		**++, --**
Rated output voltage					24 V DC
Tolerance of the output voltage					±1 %
Adjustment range of the output voltage	OUTPUT adjust	—			24-28 V DC
Rated output power		10 W	30 W	60 W	100 W
Rated output current I_r		T_a ≤ 60 °C: 0.42 A	T_a ≤ 60 °C: 1.3 A	T_a ≤ 55 °C: 2.5 A	T_a ≤ 60 °C: 4.2 A
Derating of the output current		60 °C < T_a ≤ 70 °C: 2.5 %/°C	60 °C < T_a ≤ 70 °C: 2.5 %/°C	55 °C < T_a ≤ 70 °C: 2.5 %/°C	60 °C < T_a ≤ 70 °C: 2.5 %/°C
Maximum deviation with	load change statical				max. 1 %
	change of output voltage within the input voltage range				max. 1 %
Recover time T_A					< 1 ms
Starting time after applying the supply voltage	at I_r				1000 ms
Rise time	at rated load				typ. 1 ms
Residual ripple and switching peaks	BW = 20 MHz				50 mV
Parallel connection					yes, using CP-D RU
Series connection					yes, to increase voltage
Resistance to reverse feed					35 V / 1 s
Output circuit - No-load, overload and short-circuit behavior					
Characteristic curve of output		hiccup-mode			U/I characteristic curve
Short-circuit protection					continuous short-circuit stability
Short-circuit behavior					continuation with output power limiting
Current limiting at short circuit		typ. 0.78 A	typ. 4.2 A	typ. 6.05 A	typ. 11.5 A
Overload protection					output power limiting
Overvoltage protection					30-33 V DC
No-load protection					continuous no-load stability
Starting of capacitive loads					unlimited
General data					
Efficiency		typ. 80 %	typ. 83 %	typ. 86 %	typ. 89 %
Duty cycle					100 %
Dimensions					see “Dimensional drawings”
Weight (1 pc.)	kg (lb)	0.06 (0.13)	0.19 (0.41)	0.25 (0.46)	0.32 (0.71)
Material of housing					plastic
Mounting					DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position					horizontal
Minimum distance to other units	horizontal / vertical				25 mm / 25 mm (0.98 in / 0.98 in)
Degree of protection	housing / terminals				IP20 / IP20
Protection class					II

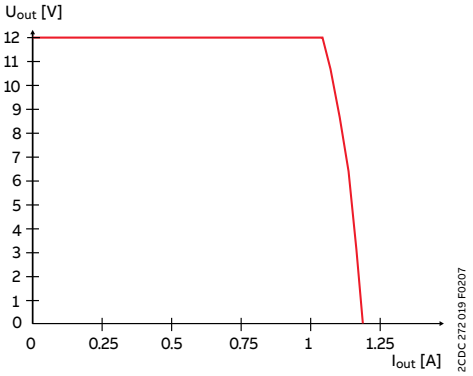
CP-D range
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

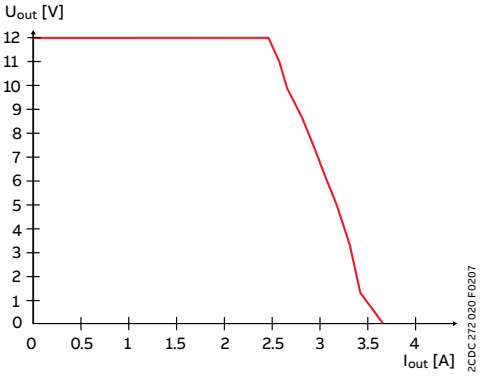
Type			CP-D 24/0.42	CP-D 24/1.3	CP-D 24/2.5	CP-D 24/4.2
Electrical connection - Input circuit / Output circuit						
Connecting capacity		fine-strand with wire end ferrule	0.2-1.5 mm² (24-16 AWG)			0.2-2.5 mm² (24-14 AWG)
		rigid	0.2-2.5 mm² (26-12 AWG)			0.2-2.5 mm² (24-12 AWG)
Stripping length				4-5 mm (0.16-0.2 in)		7 mm (0.28 in)
Tightening torque				0.6 Nm (5 lb.in)		0.7 Nm (6 lb.in)
Environmental data						
Ambient temperature range		operation				-40...+70 °C
		rated load		-40...+60 °C	-40...+55 °C	-40...+60 °C
		storage				-40...+85 °C
Altitude during operation		IEC/EN 60068-2-13				max. 4850 m
Damp heat (cyclic) (IEC/EN 60068-2-30)						4 x 24 cycles, 40 °C, 95 % RH
Vibration (sinusoidal) (IEC/EN 60068-2-6)						50 m/s², 10 Hz - 2 kHz
Shock (half-sine) (IEC/EN 60068-2-27)						40 m/s², 22 ms
Isolation data						
Rated insulation voltage U_i	input circuit / output circuit			3 kV AC	4 kV AC	3 kV AC
Pollution degree						2
Overvoltage category						II
Standards / Directives						
Standards						IEC/EN 62368-1
Low Voltage Directive						2014/35/EU
EMC Directive						2014/30/EU
RoHS Directive						2011/65/EU
Protective low voltage						SELV (IEC 60950-1)
Electromagnetic compatibility						
Interference immunity to						IEC/EN 61000-6-2
electrostatic discharge		IEC/EN 61000-4-2	level 4 (4 kV / 8 kV)		level 4 (4 kV / 15 kV)	level 4 (4 kV / 8 kV)
radiated, radio-frequency, electromagnetic field		IEC/EN 61000-4-3				level 3 (10 V/m)
electrical fast transient/burst		IEC/EN 61000-4-4				level 4 (4 kV)
surge		IEC/EN 61000-4-5				level 3 (2 kV L-L)
conducted disturbances, induced by radio-frequency fields		IEC/EN 61000-4-6				level 3 (10 V)
Interference emission						IEC/EN 61000-6-3
high-frequency radiated						class B
high-frequency conducted						class B

CP-D range
Technical diagrams

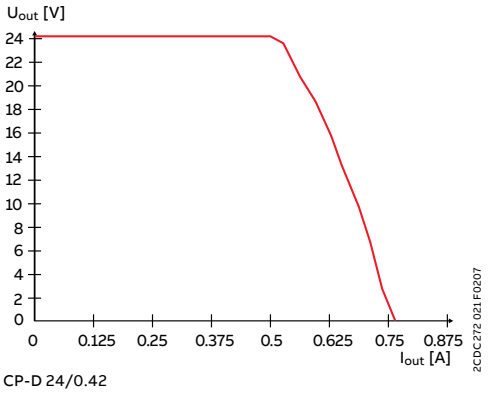
CHARACTERISTIC CURVE OF OUTPUT AT T_A = 25 °C



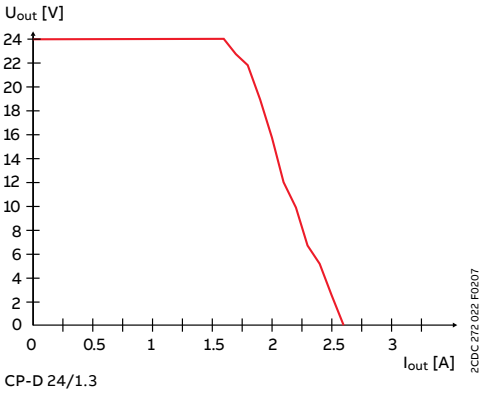
CP-D 12/0.83



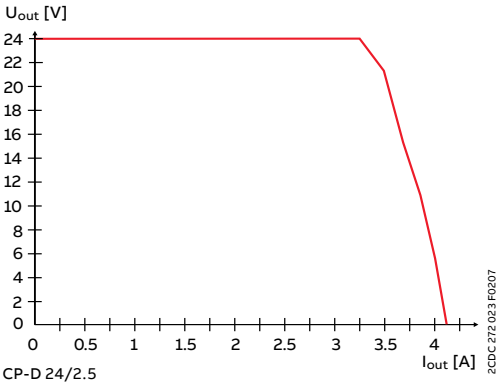
CP-D 12/2.1



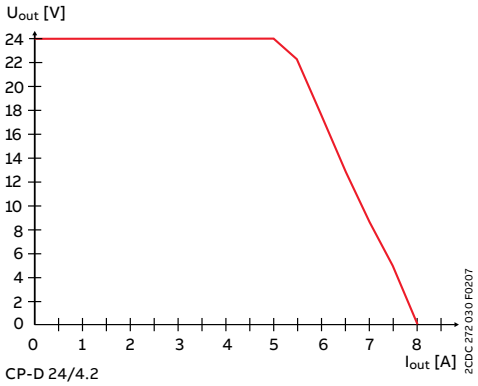
CP-D 24/0.42



CP-D 24/1.3

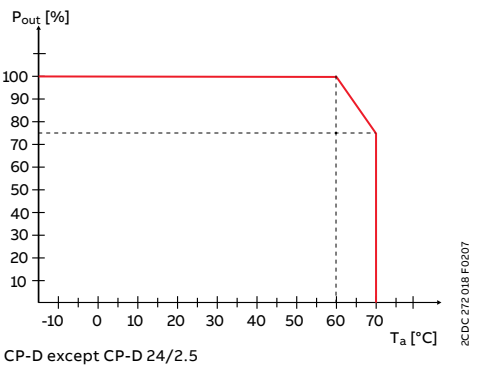


CP-D 24/2.5

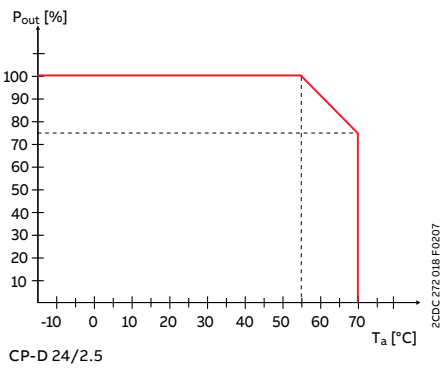


CP-D 24/4.2

CHARACTERISTIC CURVE OF TEMPERATURE AT RATED OUTPUT VOLTAGE



CP-D except CP-D 24/2.5

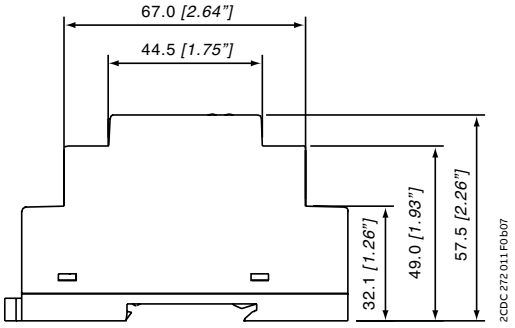


CP-D 24/2.5

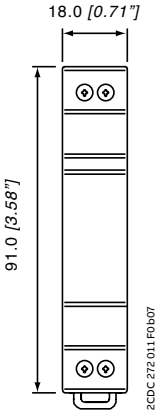
CP-D range
Technical diagrams

DIMENSIONAL DRAWINGS

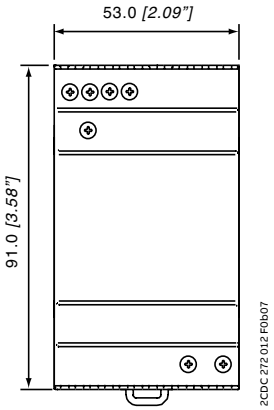
Dimensions in mm and inches



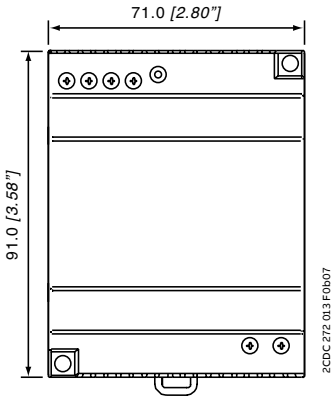
CP-D 12/0.83, CP-D 24/0.42
CP-D 12/2.1, CP-D 24/1.3
CP-D 24/2.5
CP-D 24/4.2



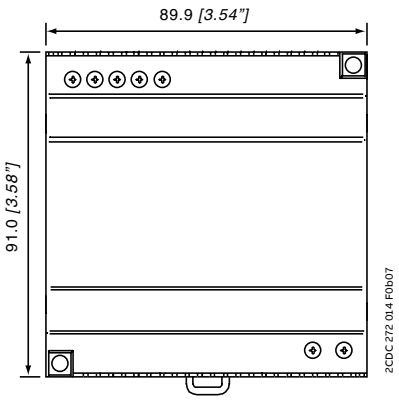
CP-D 12/0.83, CP-D 24/0.42



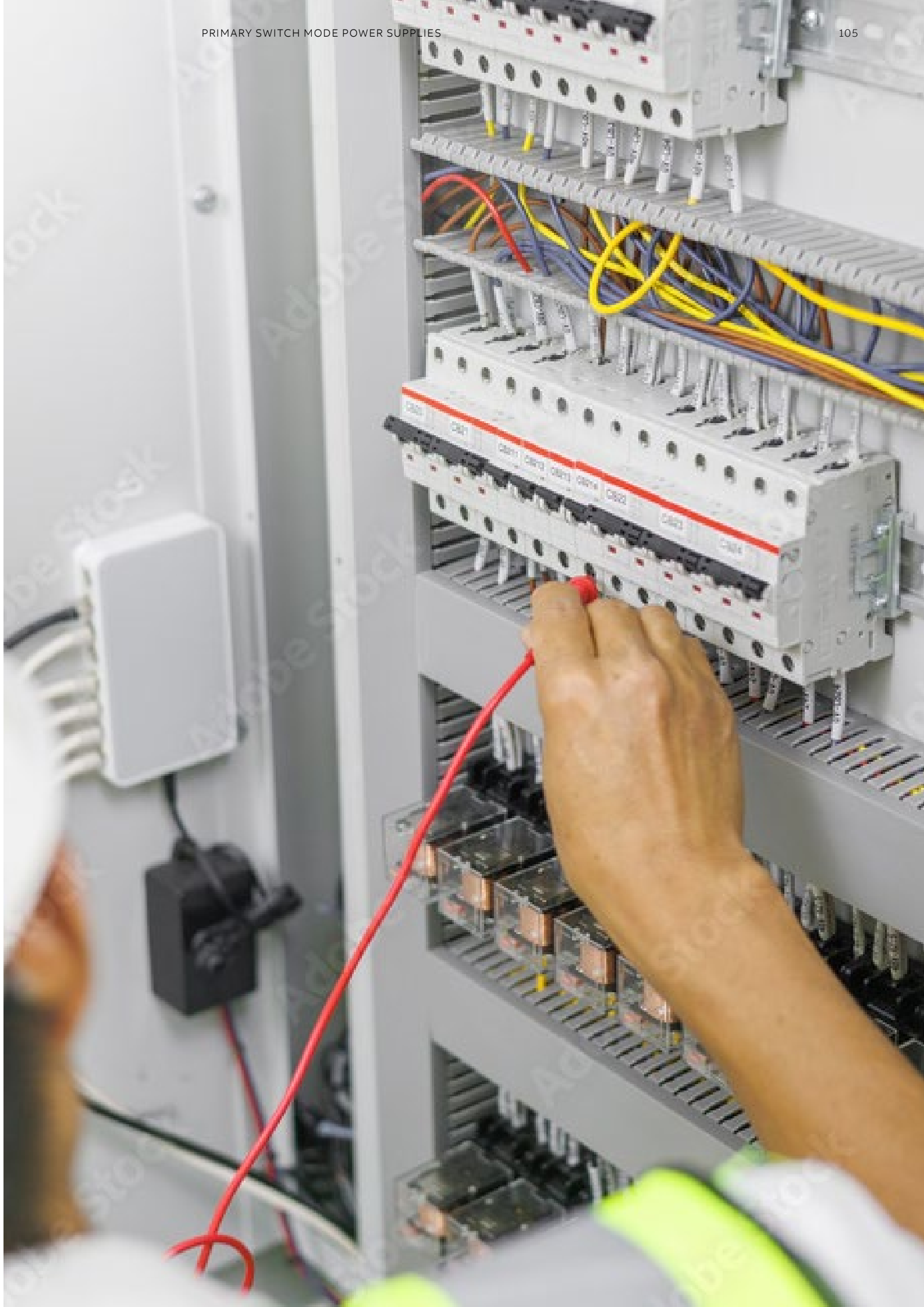
CP-D 12/2.1, CP-D 24/1.3



CP-D 24/2.5



CP-D 24/4.2




CP-B 24/3.0
CP-B 24/10.0
CP-B 24/20.0
OPERATION
INPUT OK
BUFFER STATUS
FAILURE

BUFFER MODULES CP-B RANGE

108 – 109 **Benefits and advantages**
110 **Operation controls**
111 **Applications**
112 **Ordering details**
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115 – 116 **Technical diagrams**

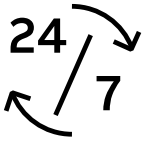
CP-B RANGE BUFFER MODULES

Benefits and advantages



ABB's ultra-capacitor based CP-B buffer modules serve to ensure a short-term uninterrupted power supply system with a voltage of 24 V DC by buffering the load in case of power loss.

The buffer modules feature a technology for storing energy: the use of ultra-capacitors obviates the need for maintenance and exempts deep discharge in comparison to batteries.



Continuous operation

- Buffering 24 V DC supply of up to 572 s
- Maintenance-free, ultra-capacitor technology
- Temperature resistant
- No discharge
- Small footprint

CP-B RANGE

Benefits and advantages

Power supply systems have to be highly reliable in most areas of energy management and automation technology. Often, batteries are used for supporting the supply system in case of mains failures. Batteries have limited lifetimes depending on environmental parameters and have to be maintained regularly, which causes extra work and costs.

Using the ultra-capacitor technology, ABB offers an innovative and completely maintenance-free new product for buffering the 24 V DC supply in case of interrupted mains on the primary side of the switch mode power supply.

The CP-B range is an ultra-capacitor buffer energy storage system for power supply units which ensures a short term uninterrupted power supply system. In case of power loss, the energy stored in the capacitor guarantees that the load is continually provided for up to several hundred seconds depending on the load current.



Characteristics

- 3 buffer modules for buffering 24 V DC:
  CP-B 24/3.0 (3 A / 1 kWs[1)])
  CP-B 24/10.0 (10 A / 13.7 kWs[1)])
  CP-B 24/20.0 (20 A / 8 kWs[1)])
- LEDs for status indication
- Relay contacts for status messaging
- Very high backup times (e.g. with CP-B 24/10.0 up to 9 minutes and 30 s at 1 A load current)
- Short charging times
- High efficiency, higher than 95 %
- Wide temperature range
- DIN rail mountable, compact housing
- Extended temperature range -40...60 °C

[1)] internal energy buffer

		CP-B 24/3.0	CP-B 24/10.0	CP-B 24/20.0
Order code		1SVR427060R0300	1SVR427060R1000	1SVR427060R2000
Rated input voltage		24 V DC	24 V DC	24 V DC
Rated current		3 A DC	10 A DC	20 A DC
Energy storage (min.)		1.000 Ws	13.700 Ws	8.000 Ws
Typical charging time at load current	100 %	65 s	134 s	135 s
	0 %	56 s	82 s	62 s
Typical buffering time[1)] at load current	100 %	13 s	50 s	15 s
	50 %	28 s	115 s	30 s
	25 %	66 s	246 s	60 s
	10 %	148 s	572 s	150 s

[1)] buffering time ≈ $\frac{\text{energy storage x 0.9}}{\text{current x output voltage}}$

CP-B RANGE

Operation controls



Input terminals
SHUT-DOWN+, SHUT-DOWN-:
Input signal terminals
INPUT OK, BUFFER STATUS, FAILURE:
Signalling contact – terminals

$L+_{IN}$, $L-_{IN}$: Input voltage terminals

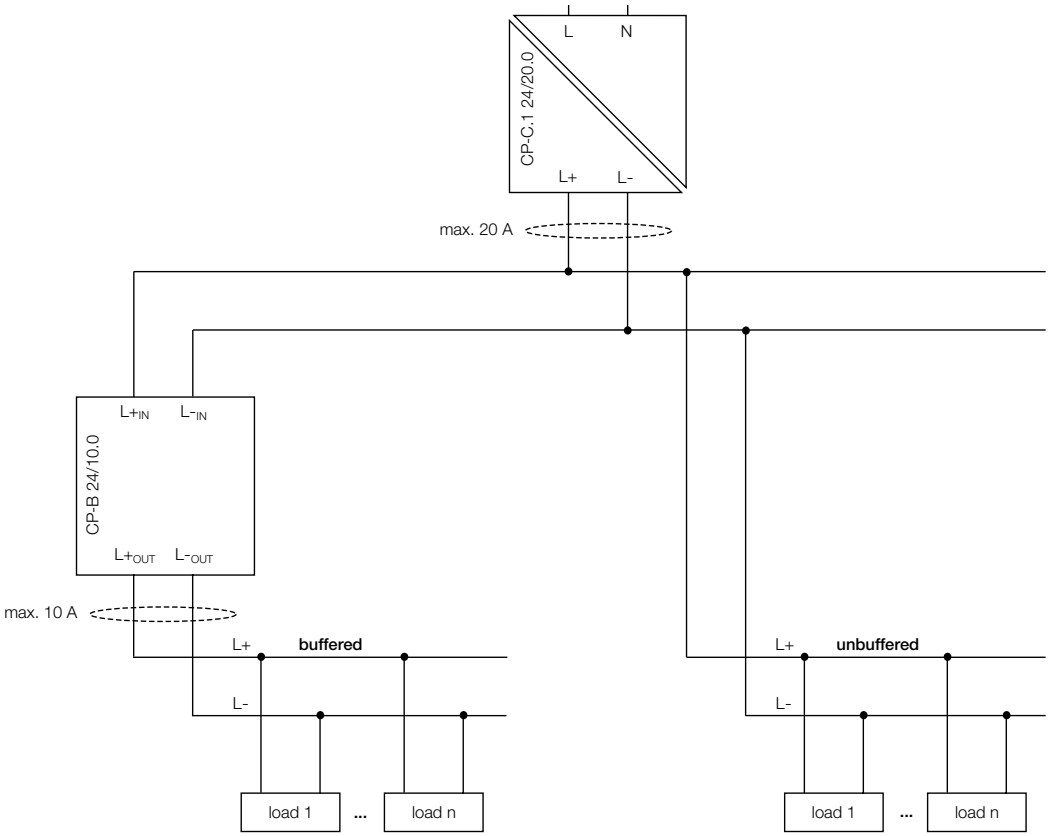
Indication of operational states
OPERATION:
Buffer module in operation (standby or buffering)
INPUT OK:
Input voltage applied
BUFFER STATUS, FAILURE:
details see table ‘LEDs, status information and fault messages‘ in data sheet

Output terminals
$L+_{OUT}$, $L-_{OUT}$, $L-_{OUT}$:
Output voltage terminals

CP-B RANGE

Applications

EXAMPLE OF APPLICATION



CP-B range
Ordering details


2CDC 271 001 S0010

CP-B 24/3.0


2CDC 271 002 S0010

CP-B 24/10.0


2CDC 271 003 S0010

CP-B 24/20.0

Description

Ultra capacitor based buffer units of the CP-B range offer the highest reliability also in harsh environments. Thanks to their ultra-cap based technology, the units are maintenance free, there will be no deep discharge and these products offer a very wide operational ambient temperature range. CP-B range buffer units are an excellent solution for avoiding voltage drops in solar applications, for example.

ORDERING DETAILS

Rated input voltage	Rated current	Type	Order code	Weight (1 pc.) kg (lb)
24 V DC	3 A DC	CP-B 24/3.0	1SVR427060R0300	0.59 (1.31)
	10 A DC	CP-B 24/10.0	1SVR427060R1000	2.10 (4.63)
	20 A DC	CP-B 24/20.0	1SVR427060R2000	2.20 (4.85)

CP-B range
Technical data

Type		CP-B 24/3.0	CP-B 24/10.0	CP-B 24/20.0
Input circuit - Supply circuit				$L+_{IN}$ $L-_{IN}$
Rated input voltage U_{in}				24 V DC
Input voltage range		23.7-26.4 V DC	23.9-27 V DC	23.4-29 V DC
Minimum charging potential		23.7 V DC	23.9 V DC	23.4 V DC
Rated input current		3 A DC	10 A DC	20 A DC
Inrush current limiting		50 A / 1 ms	35 A / 2 ms	35 A / 2 ms
Transient overvoltage protection		suppressor diode	varistor / suppressor diode	varistor / suppressor diode
Internal input fuse (apparatus protection, not accessible)		4 A slow acting	15 A (FK2)	30 A (FK2)
Internal fuse capacitors circuit (not accessible)			25 A (FK2)	
Kind of input	SHUT-DOWN	—	control input	control input
	rated voltage	—	24 V DC	24 V DC
	voltage range	—	6-45 V DC	6-45 V DC
Output circuit				$L+_{OUT}$ $L-_{OUT}$ $L-_{OUT}$
Rated output power		69 W	240 W	480 W
Rated output voltage U_{out}				24 V DC
Output voltage (buffer mode)		23.0 V DC	23.2 V DC	23.2 V DC
Tolerance of the output voltage				+2...-10 %
Rated output current I_r	$T_a \leq 60$ °C	3 A DC	10 A DC	20 A DC
Peak output current (fully loaded capacitors required)	$T_a \leq 60$ °C	6 A DC (min. 1.5 s)	20 A DC (10 A power supply + 10 A CP-B, min. 1.5 s)	40 A DC (min. 1.5 s)
Control of limiting current		—	10.3 A DC ±0.1A	—
Shut-down if limiting current is exceeded		—	after 1.5 s	—
Short-circuit protection (only via external fuse)				no continuous short-circuit stability
Internal output fuse (not accessible)		—	15 A (FK2)	—
Required external fuse		3.15 A slow acting	10 A slow acting	25 A slow acting
Current limiting at output circuit		—	1.05...1.2 x I_r	—
Breaking capacity of output circuit	t= 2.5 ms	—	24 V DC, 10 A	—
Power failure buffering time [1)]		load-dependent, min. 13 s at 100 % load	load-dependent, min. 50 s at 100 % load	load-dependent, min. 15 s at 100 % load
Overload protection				thermal protection
Kind of output	INPUT OK			n/o contact
	BUFFER STATUS	—		n/o contact
	FAILURE	—		c/o contact
Contact material				Ag + Au-clad
Minimum switching voltage / Minimum switching current				5 V DC / 1 mA
Maximum switching voltage / Maximum switching current				50 V AC / 1.0 A, 30 V DC / 0.5 A
Mechanical lifetime				5 x 10^6 switching cycles
Electrical lifetime				0.1 x 10^6 switching cycles
Maximum fuse rating to achieve short-circuit protection	n/o or n/c contact			1.0 A AC / 0.5 A DC

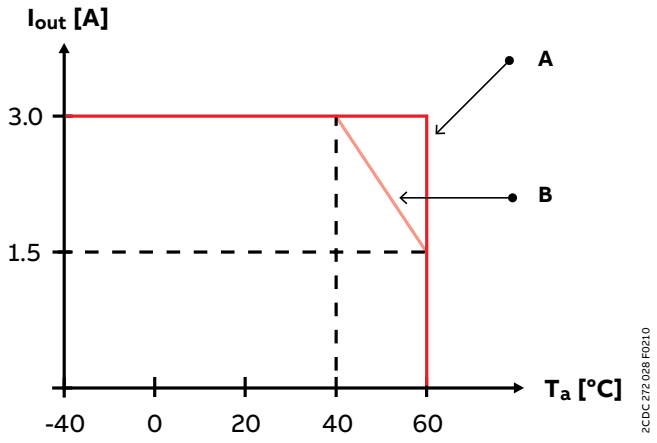
CP-B range
Technical data

Type			CP-B 24/3.0	CP-B 24/10.0	CP-B 24/20.0
General data					
Maximum internal power consumption			7 W	20 W	40 W
Power consumption with unloaded output			0.75 W	3 W	1.6 W
Energy storage (min.)			1000 Ws	13700 Ws	8000 Ws
Typical charging time at 24.5 V DC		100 %	65 s	134 s	135 s
		0 %	56 s	82 s	62 s
Typical buffering time at load current[1)]		100 %	13 s	50 s	15 s
		50 %	28 s	115 s	30 s
		25 %	66 s	246 s	60 s
		10 %	148 s	572 s	150 s
Efficiency					> 95 %
Dimensions					see “Dimensional drawings”
Material		cover / housing shell			steel sheet powdered
Mounting					DIN rail (IEC/EN 60715), snap-on mounting
Mounting position					horizontal
Minimum distance to other units		horizontal			not necessary
		vertical		40 mm (1.58 in)	80 mm (3.15 in)
Pollution degree					2
Degree of protection		housing / terminal			IP20
Protection class (IEC/EN 61140)					III SELV / PELV (condition: power supply fulfills class III)
Electrical connection - Input circuit / Output circuit			**pull spring terminals**	**pull spring terminals**	**pluggable screw type terminals**
Connecting capacity	fine-strand with(out) wire end ferrule		0.08-1.0 mm² (28-18 AWG)	0.08-1.5 mm² (28-16 AWG)	0.2-4.0 mm² (24-12 AWG)
	rigid		0.08-1.5 mm² (28-16 AWG)	0.08-4.0 mm² (28-12 AWG)	0.2-6.0 mm² (24-10 AWG)
Stripping length				6.0 mm (0.24 in)	7.0 mm (0.28 in)
Signaling circuit					
Connecting capacity	fine-strand with(out) wire end ferrule			0.08-1.0 mm² (28-18 AWG)	0.14-1.0 mm² (26-16 AWG)
	rigid			0.08-1.5 mm² (28-16 AWG)	0.14-1.5 mm² (28-16 AWG)
Stripping length				6.0 mm (0.24 in)	7.0 mm (0.28 in)
Environmental data					
Ambient temperature		operation			-40...+60 °C
		storage			-40...+60 °C
Standards / Directives					
Standards					IEC/EN 62368-1, IEC/EN 61010-1, IEC/EN 62040-2
Low Voltage Directive					2014/35/EU
EMC Directive					2014/30/EU
RoHS Directive					2011/65/EU
Electromagnetic compatibility					
Interference immunity to					IEC/EN 61000-6-2
electrostatic discharge		IEC/EN 61000-4-2			level 3, 6 kV / 8 kV
radiated, radio-frequency, electromagnetic field		IEC/EN 61000-4-3			level 3, 10 V/m (27-1000 MHz) / level 2, 3 V/m (1400-2700 MHz)
electrical fast transient/burst		IEC/EN 61000-4-4			level 3, 2(1) kV / 5 kHz
surge		IEC/EN 61000-4-5			level 1, 0.5 kV
conducted disturbances, induced by radio-frequency fields		IEC/EN 61000-4-6			level 3, 10 V (150 kHz-80 MHz)
voltage dips, short interruptions and voltage variations		IEC/EN 61000-4-11			buffered by ultra-capacitors
Interference emission					EN 61000-6-4
high-frequency radiated		DIN EN 55011			B/C1
high-frequency conducted		DIN EN 55011			B/C1

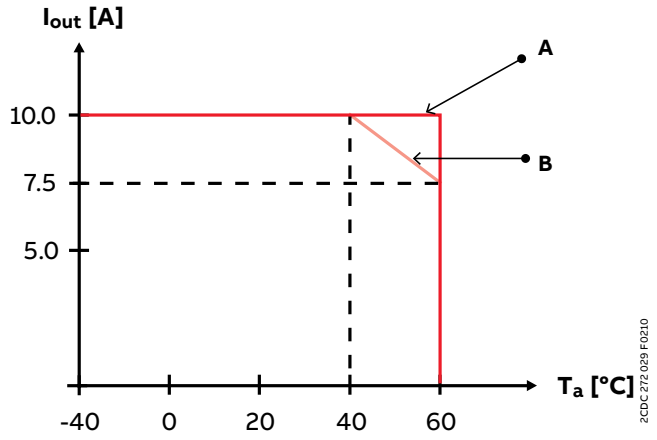
[1)] buffering time ≈ $\frac{\text{energy storage x 0.9}}{\text{current x output voltage}}$

CP-B range
Technical diagrams

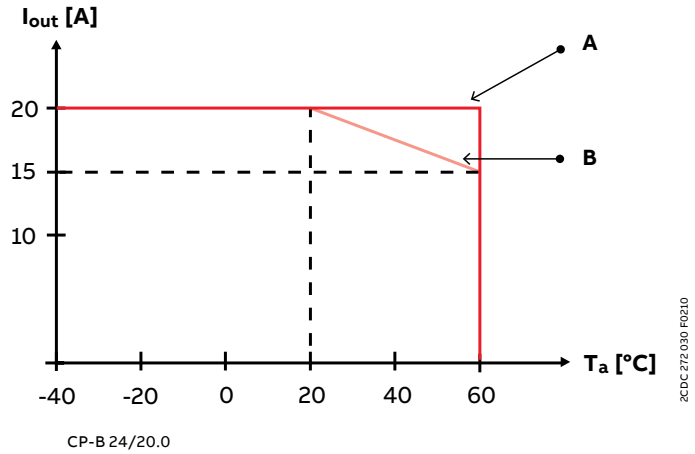
CHARACTERISTIC CURVE OF THE TEMPERATURE AT RATED LOAD



CP-B 24/3.0



CP-B 24/10.0

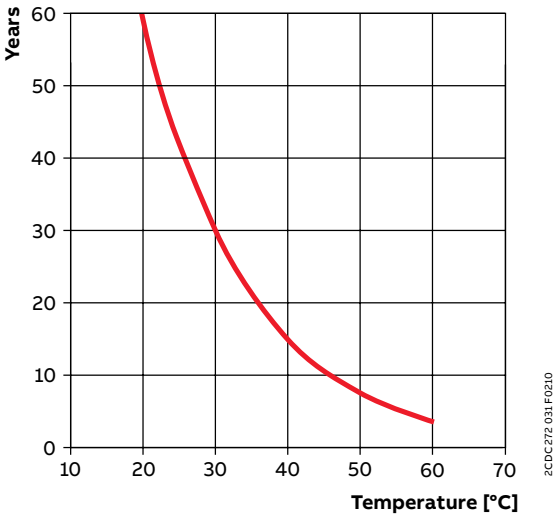


CP-B 24/20.0

A Normal application (up to 50 % buffer mode, 5 charging and discharging cycles in direct series)

B Continuous charging and discharging in direct series. As this is not typical of a real application, this should be considered as theoretical indication

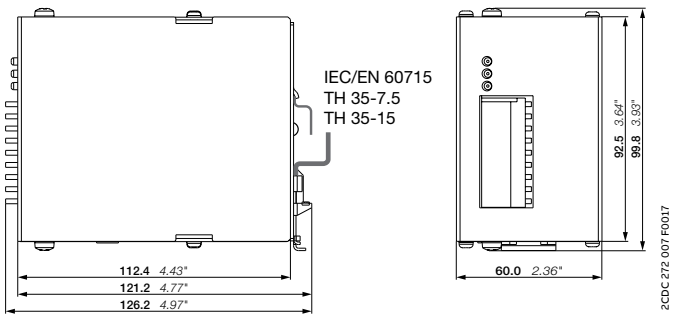
CAPACITORS LIFE SPAN OVER TEMPERATURE



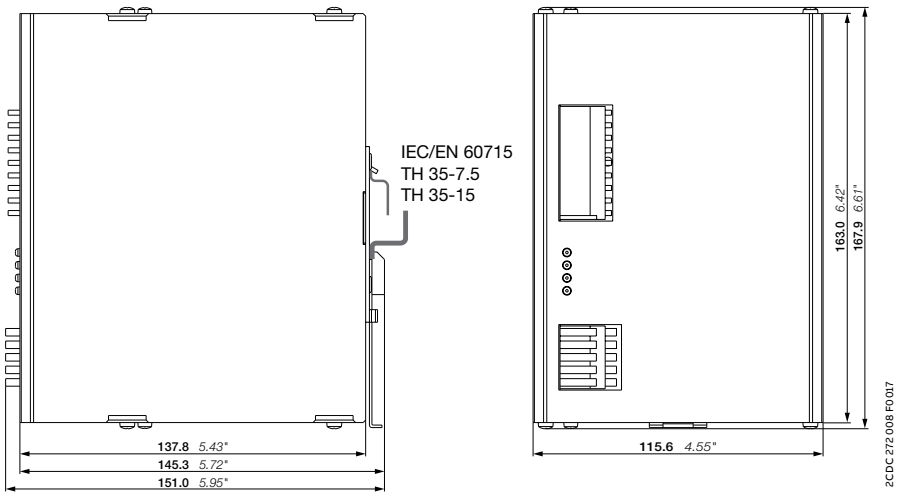
CP-B range
Technical diagrams

DIMENSIONAL DRAWINGS

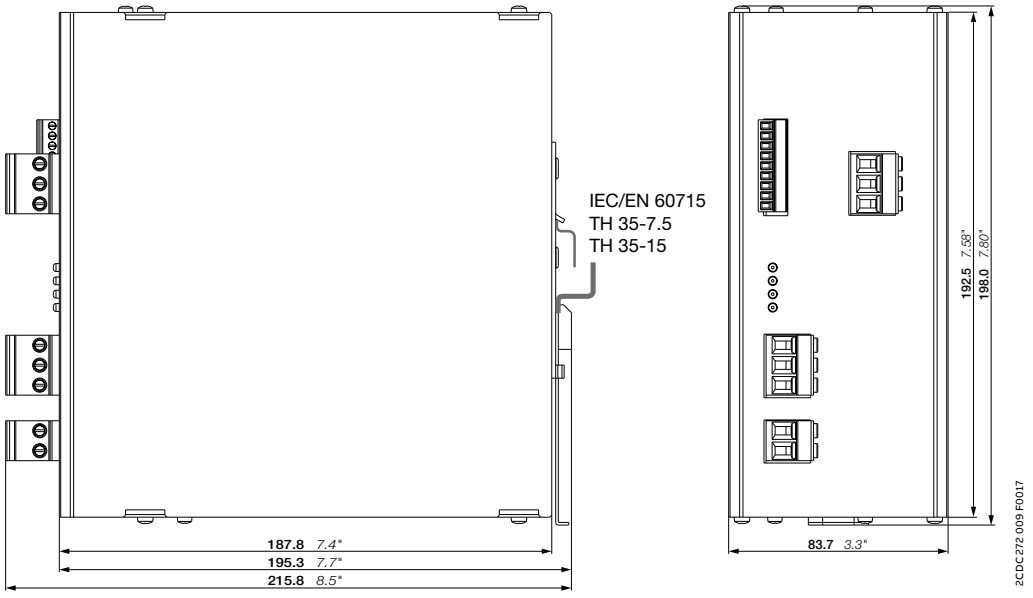
Dimensions in **mm** and inches



CP-B 24/3.0



CP-B 24/10.0



CP-B 24/20.0



81077


INPUT 1
INPUT 2
ABB
CP-C.1-A-RU
OUTPUT
INPUT 1
INPUT 2
ABB
CP-C.1-A-RU
OUTPUT
IN1
IN2
IN1 IN2
ABB
CP-D RU
OUT

REDUNDANCY UNITS

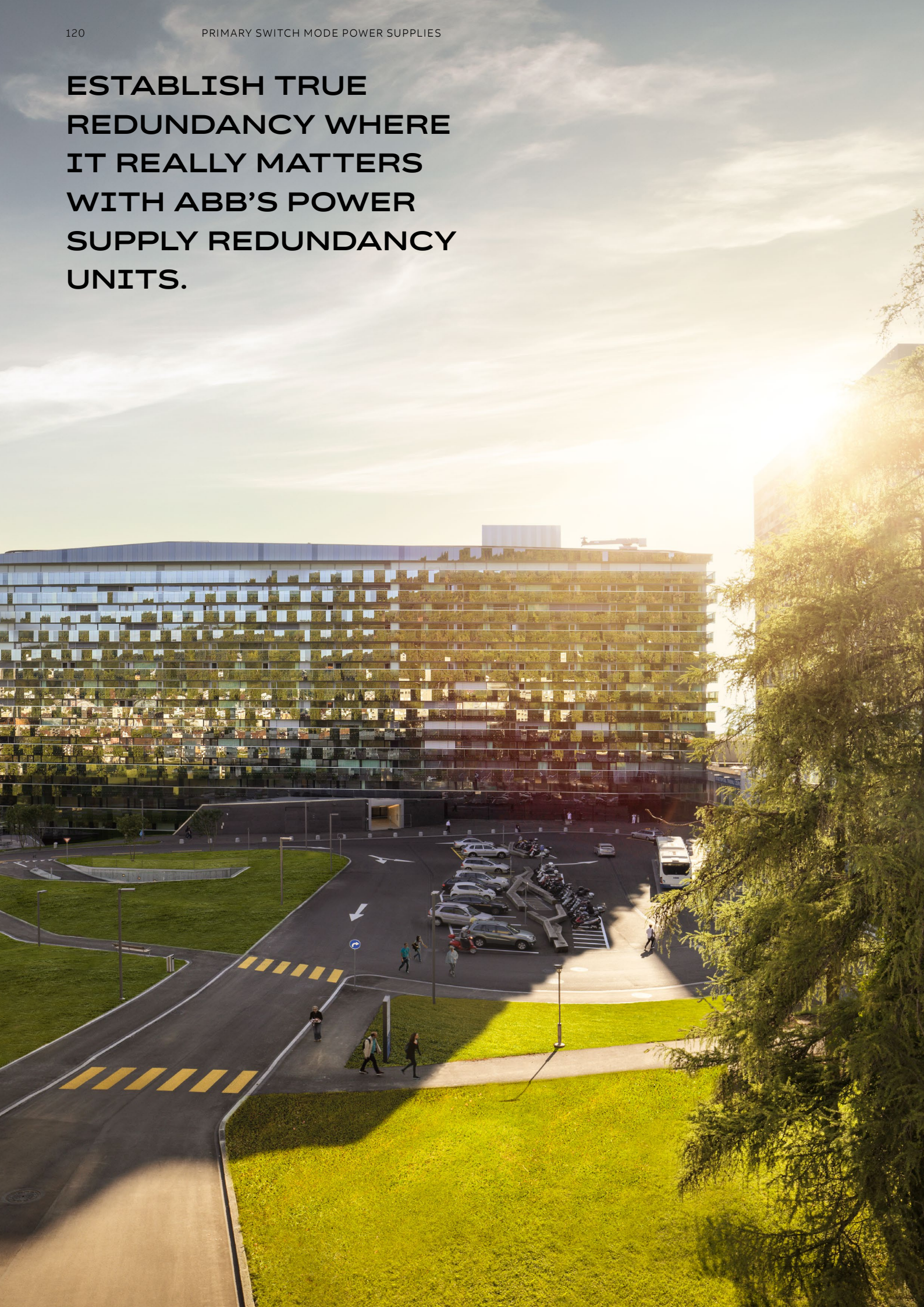
121 **Benefits and advantages**

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123 – 125 **Technical data**

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ESTABLISH TRUE REDUNDANCY WHERE IT REALLY MATTERS WITH ABB'S POWER SUPPLY REDUNDANCY UNITS.



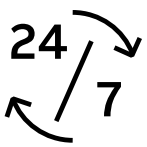
REDUNDANCY UNITS

Benefits and advantages



ABB's redundancy units are used to establish true redundancy, which increases the availability of electrical systems significantly. Three versions are available with different output currents and power supply housings:

- CP-D RU in MDRC housing
- CP-C.1-A-RU for a true redundant setup of two 56 V DC power supplies of the CP range



Continuous operation

Highest system reliability

- Redundancy setup of the application possible to allow parallel operation
- Long lifetime

Redundancy units
Ordering details



CP-C.1-A-RU



CP-C.1-A-RU-L



CP-D RU

Description

Whenever the highest availability and reliability are key requirements, a true redundancy setup with two power supplies connected to a redundancy unit is the best solution. In case one power supply fails, the other one keeps supplying the load. Furthermore, even a short circuit in one power supply will not affect the other one, which keeps supplying the load. The CP-C.1-A-RU is also available with coated PCBA (CP-C.1-A-RU-C) for harsh environments.

ORDERING DETAILS - CP-C.1-A-RU FOR DECOUPLING OF CP POWER SUPPLIES UP TO 20 A PER INPUT / CHANNEL

Input voltage range	Rated input current per channel	Rated output voltage / current		Type	Order code	Weight (1 pc.) kg (lb)
10 - 58 V DC	20 A	12 - 48 V DC / 2 x 20 A or 1 x 40 A	uncoated	CP-C.1-A-RU	1SVR360060R1001	1.04 (2.29)
			coated	CP-C.1-A-RU-C	1SVR360060R2001	1.04 (2.29)
			uncoated	CP-C.1-A-RU-L	1SVR361060R1001	1.04 (2.29)

The CP-D RU provides decoupling of two power supply units and ensures automatic redundant power supply operation for critical applications. The redundancy unit in MDRC design (modular DIN rail components) fits into all domestic installation and distribution panels.

ORDERING DETAILS - CP-D RU FOR DECOUPLING OF TWO CP-D POWER SUPPLY UNITS

Input voltage range	Rated input current per channel	Rated output voltage / current	Type	Order code	Weight (1 pc.) kg (lb)
9-35 V DC	5 A	24 V DC / 1 x 10 A	CP-D RU	1SVR427049R0000	0.075 (0.165)

Redundancy units
Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Type		CP-C.1-A-RU, CP-C.1-A-RU-L	CP-C.1-A-RU-C
Input circuit - Supply circuit			**(+/+, -/-)**
Rated input voltage U_{in}			12-48 V DC
Input voltage range			10 - 58 V DC
Rated input current I_{in} per channel	-25 °C ≤ T_a ≤ 60 °C		20 A
Maximum input current per channel	-25 °C ≤ T_a ≤ 40 °C		30 A
	-40 °C ≤ T_a ≤ 40 °C	—	30 A
Transient overvoltage protection			yes, varistor
Output circuit			**(++/--)**
Rated output voltage U_{out}			12 - 48 V DC
Voltage drop input/output			typ. 0.6 V, max. 0.9 V
Rated output current I_r	-25 °C ≤ T_a ≤ 60 °C		2 x 20 A or 1 x 40 A
Max. output current (Power reserve)	-25 °C ≤ T_a ≤ 40 °C		2 x 30 A or 1 x 60 A
	-40 °C ≤ T_a ≤ 40 °C	—	2 x 30 A or 1 x 60 A
Derating of the output current	60 °C < T_a ≤ 70 °C		2.5 % per Kelvin temperature increase
Resistance to reverse feed			< 60 V
General data			
Power loss	input 2 x 20 A		23.0 W
	input 2 x 10 A		9.4 W
	input 2 x 5 A		4.1 W
MTBF	acc. to MIL 217 HDBK		on request
Dimensions			see "Dimensional drawings"
Material of housing	cover / housing shell / front		aluminium / zinc-coated sheet steel / plastic
Mounting			DIN rail (IEC/EN 60715), snap-on mounting
Mounting position			1 and 7
Minimum distance to other units	horizontal / vertical		25 mm (0.98 in) / 25 mm (0.98 in)
Degree of protection (IEC/EN 60529)	housing / terminals		IP20 / IP20
Protection class (IEC/EN 61140)			III
Electrical connection - Input circuit / Output circuit			
Connecting capacity	fine-strand with(out) wire end ferrule		2.5-10 mm² (12-8 AWG)
	rigid		2.5-16 mm² (12-6 AWG)
Stripping length			10 mm (0.39 in)
Tightening torque			1.2 Nm (10.5 lb.in)
Recommended screw driver			PH1 / Ø 4.0 x 0.8 mm (0.16 x 0.03 in)

Redundancy units

Technical data

Type		CP-C.1-A-RU, CP-C.1-A-RU-L	CP-C.1-A-RU-C
Environmental data			
Ambient temperature range	operation	-25…+70 °C (-13… +158 °F)	-40…+70 °C (-40…+158 °F)
	rated load	-25…+60 °C (-13… +140 °F)	-40…+60 °C (-40…+140 °F)
	storage	-40…+85 °C (-40…+185 °F)	
	transportation	-40…+85 °C (-40…+185 °F)	
Climatic class (IEC/EN 60721-3-1)	storage	1K2	
Climatic class (IEC/EN 60721-3-2)	transportation	2K2	
Climatic class (IEC/EN 60721-3-3)	operation	3K3	
Damp heat, cyclic (IEC/EN 60068-2-30)		test Db: 55 °C, 2 cycles	
Vibration (IEC/EN 60068-2-6)		test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis	
Shock, half-sine (IEC/EN 60068-2-27)		test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis	
Coated PCBA		no	yes
Gaseous corrosive environment withstand test (IEC/EN 60068-2-60)		—	testing method: 4 testing period: 21 days ambient conditions: 25 °C, 75 % r.h. air/volume change rate per hour: 3-6 sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3 IEC 60721-3.3 acc. 3C2/3C3 - H_2S ≥ 100 ± 10 ppb - SO_2/SO_3 ≥ 300 ± 20 ppb - Cl_2 ≥ 100 ± 10 ppb - NO_x ≥ 1250 ± 20 ppb
Isolation data			
Rated impulse withstand voltage U_{imp} (EN62477-1)	input / housing	1.5 kV (1.2/50 µs)	
	output / housing	1.5 kV (1.2/50 µs)	
Pollution degree		2	
Standards / Directives			
Standards		IEC/EN 61204	
EMC Directive		2014/30/EU	
ATEX Directive		—	2014/34/EU
RoHS Directive		2011/65/EU	
Electrical safety		IEC/EN 61010-1 and IEC/EN 61010-2-201	
Process control equipment		UL 61010-1, UL 61010-2-201/CAN/CSA C22.2 No. 61010-1-12, CAN/CSA-IEC 61010-2-201:18	
Electromagnetic compatibility			
Interference immunity to			
electrostatic discharge	IEC/EN 61000-4-2	Level 4, contact discharge ±8 kV, air discharge ±15 kV (criterion B)	
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3, DC mains inputs and output ±2 kV (criterion B)	
surge	IEC/EN 61000-4-5	Level 1, DC mains inputs and output ±0.5 kV, input and output vs. PE ±1 kV (criterion B)	

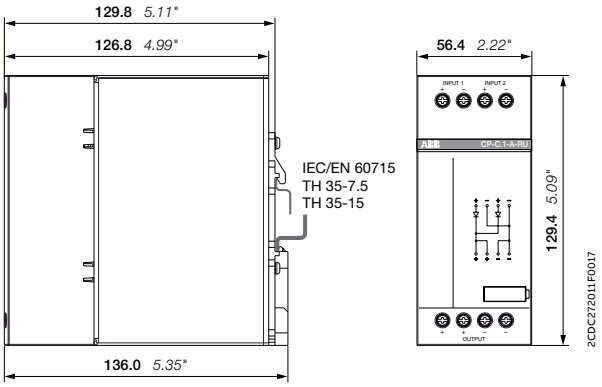
Redundancy units
Technical data

Type		**CP-D RU**
Input circuit - Supply circuit		**IN 1 + + -, IN 2 + + -**
Rated input voltage U_{in}		24 V DC
Input voltage range		9-35 V DC
Rated input current I_{in} per channel		5 A
Maximum input current per channel		10 A for 300 s
Transient overvoltage protection		no
Output circuit		**OUT + + +, - - -**
Rated output voltage U_{out}		24 V DC
Voltage drop		typ. 0.5 V
Rated output current I_{out}		10 A
Resistance to reverse feed		< 35 V
General data		
MTBF		on request
Duty cycle		100 %
Dimensions		see “Dimensional drawings”
Material of housing		plastic
Mounting		DIN rail, snap-on mounting without any tool
Mounting position		1, 7
Minimum distance to other units	horizontal / vertical	25 mm (0.98 in) / 25 mm (0.98 in)
Electrical connection - Input circuit / Output circuit		
Connecting capacity	fine-strand with (out)wire end ferrule	0.2-2.5 mm² (24-14 AWG)
	rigid	0.2-2.5 mm² (24-12 AWG)
Stripping length		7.0 mm (0.28 in)
Tightening torque		0.67 Nm (6 lb.in)
Environmental data		
Ambient temperature range	operation	-40...+70 °C
	storage	-40...+85 °C
Relative humidity	RH at 40 °C	20-95 %, no condensation
Vibration (IEC/EN 60068-2-6)		mounting by rail: 10-500 Hz, 2 G, along X, Y, Z each axis, 60 min for each axis
Shock (IEC/EN 60068-2-27)		15 G, 11 ms, 3 axis, 6 faces, 3 times for each face
Standards / Directives		
Standards		IEC/EN 62368-1, IEC/EN 61204-3
RoHS Directive		2011/65/EU
Electromagnetic compatibility		
Interference immunity to		EN 55024
electrostatic discharge	IEC/EN 61000-4-2	level 3, air discharge 8 kV, contact discharge 4 kV
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	level 3, 10 V/m
electrical fast transient/burst	IEC/EN 61000-4-4	level 3, 2 kV / 5 kHz
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3, 10 V
Interference emission		EN 55032
high-frequency radiated	IEC/CISPR 32 / EN 55032	class B
high-frequency conducted	IEC/CISPR 32 / EN 55032	class B

Redundancy units
Technical diagrams

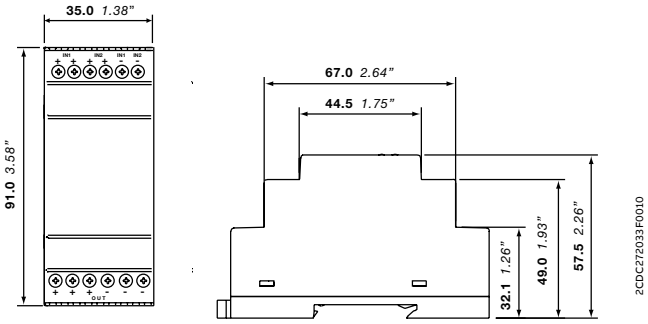
DIMENSIONAL DRAWINGS

Dimensions in **mm** and inches



CP-C.1-A-RU, CP-C.1-A-RU-L

CP-C.1-A-RU-C



CP-D RU


ABB
CP-S.1 24/3.0
OUTPUT 24 V DC 3 A
OUTPUT OK
OUTPUT Adjust 24-28 V
INPUT 100-240 V AC
CP-S.1 24/5.0
OUTPUT 24 V DC 5 A
CP-S.1 24/10.0
OUTPUT 24 V DC 10 A
CP-S.1 24/20.0
OUTPUT 24 V DC 20 A
CP-S.1 24/40.0
OUTPUT 24 V DC 40 A
INPUT 110-240 V AC

ELECTRONIC PROTECTION DEVICES EPD24

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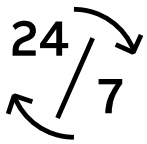
ELECTRONIC PROTECTION DEVICES EPD24

Benefits and advantages



Electronic protection devices are used for the reliable protection of standard components in industrial automation applications with 24 V DC. The EPD24 offers selective overcurrent protection for the loads connected and react to short circuit or overload more rapidly than the supplying switch mode power supply; they then selectively switch off the electrical circuit affected. In this way straightforward,

quick troubleshooting is made possible. The 4-channel devices feature very high efficiency and significantly reduced power loss. With a rated current setting from 0.5 to 12 A, a width of 25 mm, seamless expandability by means of jumpers, front-top wiring and straightforward combination with ABB switch mode power supplies, they ensure a uniform portfolio.



Continuous operation

Highlights

- Safety and reliability
- Operational continuity
- Worldwide use thanks to relevant certifications
- Compact and effective

ELECTRONIC PROTECTION DEVICES EPD24

Applications

Features
- 4-channel electronic protection device
- 24 V DC supply terminal
- Variable rated currents can be set on Advanced from 0.5 A to 12 A or on Entry from 1 A to 10 A
- Selective load protection using electronic trip characteristic curve
- Advanced with active linear current limiting, total current max. 48 A
- Entry with time-controlled tripping, total current max. 40 A
- Integrated fail-safe element matched to the maximum rated current
- Very high efficiency
- No derating up to 60 °C ambient temperature
- Switching on of capacitive loads up to 40,000 µF at 12 A rated current
- ON/OFF/Reset button with multicolor LED status indicator
- Signal output (13, 14) with 1 NO contact for group signaling
- Reset input (RST) for remote resetting of tripped channels
- All connection terminals equipped with push-in terminals
- Several devices can be combined using power jumpers for supply and signal jumpers for 0 V, signal and reset
- Entry and Advanced devices can be combined using jumpers

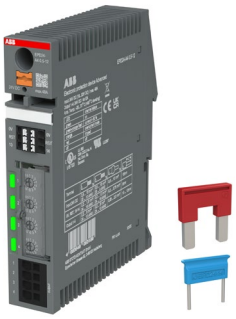
Applications
- Packaging machines
- Automation
- Automation & Process Control
- Automotive Manufacturing
- Chemical, Oil & Gas
- Medical Equipment
- Pharmaceutical & Food
- Power Engineering DC 24 V
- Renewable Energy
- Steel Production







Electronic protection devices EPD24
Ordering details



EPD24-A4 0.5-12, Power jumper for 24 V DC and signal jumper for 0 V, signal and reset

Description
Switch mode power supplies provide a 24 V DC output voltage for supplying electronic protection devices with up to 4 load circuits. The response threshold for the output current can be set individually for each channel output using a latching rotary switch. If the adjustable threshold is exceeded due to a fault, the channel output switches off automatically according to a specified trip characteristic curve. The load circuit can be switched on again directly at the device using the button (ON/OFF/Reset) or by means of remote reset (RST). A multicolor LED indicates the status of the channel output. The state of the output channel can be further processed via a group signal output (13, 14).

APPLICATION

Entry EPD24-E4 1-10
Devices without current limiting such as the Entry EPD24-E4 1-10 selectively protect 24 V DC load circuits from 1 A to max. 10 A and, if there is an overload or short circuit, switch off using a time-controlled trip characteristic curve.

The electronic characteristic curve ensures the reliable protection of standard automation components such as sensors/actuators, controllers, bus couplers, etc.

Advanced EPD24-A4 0.5-12
The active linear current limiting in the Advanced EPD24-A4 0.5-12 provides optimal protection for the switch mode power supply, even with a low current reserve. The electronic protection device selectively protects all 24 V DC load circuits in the range from 0.5 A to max. 12 A and limits the output current linearly. Inrush currents for capacitive loads up to 40,000 µF at

12 A rated current are tolerated, peak currents limited. This electronic characteristic curve with current limiting ensures (just like the Entry) the reliable protection of standard automation components such as sensors/actuators, controllers, bus couplers, etc. In addition, the inte-grated current limiting makes it possible to protect, among other items, drive technology, control technology for frequency converters, stepper motors, as well as to provide overcurrent protection for mechanical contacts on relays and safety switchgear with a limited current carrying capacity.

A brief dip in the output voltage at the switch mode power supply is also prevented by means of the active current limiting. If there is a fault, the device switches off the circuit with the fault after maximum of 3 s. As such, selective tripping increases machine availability if there is a fault.

ORDERING DETAILS
ELECTRONIC PROTECTION DEVICES

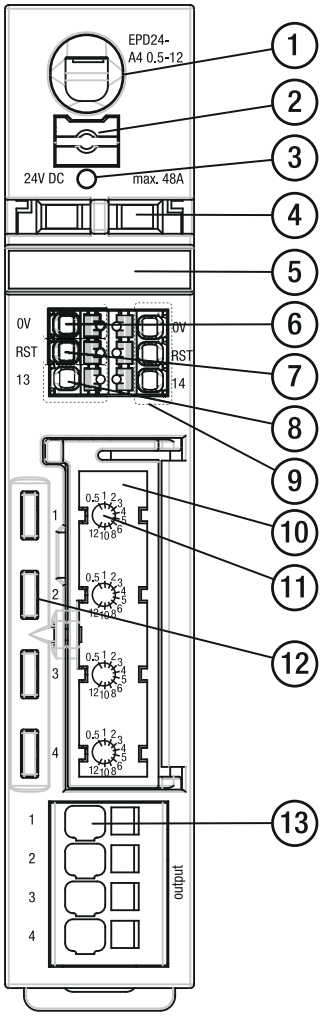
Order code	Type	Function	Input	Characteristics	Channels	Rated current
2CDE601102R0110	EPD24-E4 1-10	Entry	24 V DC	Time-controlled tripping	4	1 – 10 A
2CDE601102R0512	EPD24-A4 0.5-12	Advanced	24 V DC	Active current limiting	4	0.5 – 12 A

ACCESSORIES

Order code	Type	Characteristics
2CDE605300R0010	EPD24 Jumper (1 Set)	1 power jumper for 24 V DC and 3 signal jumpers for 0 V, signal and reset
2CDE605300R0050	EPD24 Jumper (5 Set)	5 power jumper for 24 V DC and 15 signal jumpers for 0 V, signal and reset
2CDE605300R0250	EPD24 Jumper (25 Set)	25 power jumper for 24 V DC and 75 signal jumpers for 0 V, signal and reset

Electronic protection devices EPD24

Operating elements



1. Push-in connection for 24 V DC input voltage (Input 24 V DC)
2. Pushbutton for disconnecting from the feed conductor
3. Measuring point for the 24 V DC input voltage
4. Terminal for red power jumper to transfer input voltage
5. Labeling plate
6. 0 V connection for internal supply, with pushbutton
7. Reset input (RST) connection, with pushbutton
8. Connection for signal output, NO contact (13, 14), with pushbutton
9. Terminals for blue jumpers for 0 V, signal and reset
10. Sealable cover for rated current setting
11. Rated current setting, 10-position latching rotary switch per output
12. ON/OFF/Reset button with multicolor LED status indicator per output
13. Load circuit channel output (Output 1–4)

Terminal	1x	1x	1x	L
Input 24 V DC	0.5 … 16 mm² 20 … 10 AWG	0.5 … 16 mm² 20 … 8 AWG	0.5 … 10 mm²	18 mm
0 V, RST (13, 14)	0.2 … 1.5 mm² 24 … 16 AWG	0.2 … 1.5 mm² 24 … 16 AWG	0.2 … 0.75 mm²	8 mm
Output 1-4	0.2 … 6 mm² 24 … 10 AWG	0.2 … 6 mm² 24 … 10 AWG	0.25 … 2.5 mm²	10 … 12 mm

If the ambient temperature (operation) exceeds 40 °C, use conductors with insulation temperature resistance of 90 °C.

Electronic protection devices EPD24

Technical data

Data for rated values Ta = 23 °C, U_{in} = 24 V DC, unless otherwise specified.

		Entry EPD24-E4 1-10	Advanced EPD24-A4 0.5-12
Input data			
Rated voltage U_{in}			24 V DC
Operating voltage		18 ... 30 V DC	18 ... 32 V DC
Total rated current I_n		max. 40 A	max. 48 A
Suitable for battery-buffered applications		no	On request
Rated insulation voltage U_i		30 V DC (load circuit)	32 V DC (load circuit)
Standby current I_0		typ. 33 mA	typ. 17 mA
Reverse power supply		max. 30 V DC	max. 32 V DC
Reverse polarity protection			Yes, not including load
Output data			
Output		Power MOSFET switching output (positive switching) without galvanic isolation	
Trip characateristic		Time-controlled tripping	Active current limiting
Fuse type			electronic
Overload tripping I_{OL} with trip time t_{OL}		See page <?>, trip characteristic curve, Entry EPD24-E4 1-10 for time-controlled tripping typ. I_{OL} at >1.05 x I_n, typ. t_{OL} = 3 s typ. I_{OL} at >1.35 x I_n, typ. t_{OL} = 0.5 s typ. I_{OL} at >2.00 x I_n, typ. t_{OL} = 0.1 s typ. I_{OL} at >2.5 x I_n, typ. t_{OL} = 0.012 s typ. I_{OL} at >3.0 x I_n, typ. t_{OL} = 0.002 s	See page <?>, trip characteristic curve, Advanced EPD24-A4 0.5-12 with active current limiting typ. I_{OL} at 1.2 x I_n, typ. t_{OL} = 3 s
Short circuit tripping I_{SC} with trip time t_{SC}		See page <?>, trip characteristic curve, Entry EPD24-E4 1-10 for time-controlled tripping typ. I_{SC} at >3.0 x I_n, typ. t_{SC} = 0.002 s	See page <?>, trip characteristic curve, Advanced EPD24-A4 0.5-12 with active current limiting typ. t_{SC} = 0,01...1 s applies to: I_n = 0.5 A: typ. I_{SC} at 8 x I_n I_n = 1 A: typ. I_{SC} at 4 x I_n I_n = 2 A: typ. I_{SC} at 2 x I_n I_n = 3...5 A: typ. I_{SC} at 1.6 x I_n I_n = 6...12 A: typ. I_{SC} at 1.4 x I_n
Output voltage U_{out}		$U_{out} = U_{in} - (I_a * 12$ mV/A) (typ. pro 1 A ca. 12 mV)	$U_{out} = U_{in} - (I_a * 14$ mV/A) (typ. pro 1 A ca. 14 mV)
Number of outputs			4 channels
Rated current setting per channel output I_a		1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 A	0,5 / 1 / 2 / 3 / 4 / 5 / 6 / 8 / 10 / 12 A
Rated current factory setting per channel output		10 A	12 A
Load current warning limit		typ. 80 % I_n, Warning limit hysteresis typ. 5 % (referred to I_n)	
If mounted individually: output current up to 60 °C per output (rated value)		10 A	12 A
	Derating 60 °C ... 70 °C	2 %/K per channel output	2.5 %/K per channel output
Parallel connection of outputs			Not permissible
Freewheeling circuit		External freewheeling circuit for inductive load (design to suit load)	
Undervoltage tripping			OFF at typ. U_{in} < 16 V DC ON at typ. U_{in} > 19 V DC Hysteresis typ. 2 V
Delay for switching on	Cascaded switching on of all outputs after power on with 24 V DC		Channel 1: typ. 100 ms Channel 2: typ. 200 ms Channel 3: typ. 300 ms Channel 4: typ. 400 ms
	Cascaded switching on of all outputs after switching on the outputs remotely or after undervoltage		Channel 1: typ. 5 ms Channel 2: typ. 100 ms Channel 3: typ. 200 ms Channel 4: typ. 300 ms
Fuse protection required			Not necessary, integrated fail-safe element
Rated current, fail-safe element (per output channel)		16 A	25 A
Status indicator			LED (green, orange, red)
Efficiency		99.4 %	99.3 %
Power loss		5.6 W at max. 40 A	8.5 W at max. 48 A
Capacitive load		Up to 20,000 µF (depending on the power supply unit and the current setting)	Up to 40,000 µF (depending on the power supply unit and the current setting)

Electronic protection devices EPD24

Technical data

	Entry EPD24-E4 1-10	Advanced EPD24-A4 0.5-12
Signal inputs and outputs		
SIGNAL OUTPUT 13-14		
Description	Group signal output 13-14	
Contact arrangement	Potential-free signal output, NO contact (optocoupler)	
Operating voltage	10 … 30 V DC	
Operational current	1 … 200 mA	
RESET RST		
Input voltage	8 … 32 V DC (reset with rising edge)	
Current consumption	typ. 2.8 mA (at 24 V DC)	
Pulse length	≥ 100 ms (High-Signal) ≥ 100 ms (Low-Signal)	
Voltage	> 8 V DC (High-Signal) ≤ 3 V DC (Low-Signal)	
Connection data		
INPUT 24 V DC		
Connection type	Push-in terminal	
Stripping length	18 mm	
Tool	Slotted screwdriver with a blade width of 3.5 mm	
Conductor cross-section, rigid	0.5 mm² … 16 mm² AWG 20…10	
Conductor cross-section, flexible	0.5 mm² … 16 mm² AWG 20…8	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.5 mm² … 10 mm²	
INPUT 0 V		
Connection type	Push-in terminal	
Stripping length	8 mm	
Tool	Slotted screwdriver with a blade width of 2.5 mm	
Conductor cross-section, rigid	0.2 mm² … 1.5 mm² AWG 24…16	
Conductor cross-section, flexible	0.2 mm² … 1.5 mm² AWG 24…16	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.2 mm² … 0,75 mm²	
OUTPUT 1-4		
Connection type	Push-in terminal	
Stripping length	10…12 mm	
Tool	Slotted screwdriver with a blade width of 3.5 mm	
Conductor cross-section, rigid	0.2 mm² … 6 mm² AWG 24…10	
Conductor cross-section, flexible	0.2 mm² … 6 mm² AWG 24…10	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.25 mm² … 2.5 mm²	
SIGNAL OUTPUT 13-14		
Connection type	Push-in terminal	
Stripping length	8 mm	
Tool	Slotted screwdriver with a blade width of 2.5 mm	
Conductor cross-section, rigid	0.2 mm² … 1.5 mm² AWG 24…16	
Conductor cross-section, flexible	0.2 mm² … 1.5 mm² AWG 24…16	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.2 mm² … 0.75 mm²	
RESET RST		
Connection type	Push-in terminal	
Stripping length	8 mm	
Conductor cross-section, rigid	0.2 mm² … 1.5 mm² AWG 24…16	
Tool	Slotted screwdriver with a blade width of 2.5 mm	
Conductor cross-section, flexible	0.2 mm² … 1.5 mm² AWG 24…16	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.2 mm² … 0.75 mm²	

Electronic protection devices EPD24
Technical data

	Entry EPD24-E4 1-10	Advanced EPD24-A4 0.5-12
General data		
Ambient temperature (operation)	-25 °C … +70 °C ; -25 °C … +65 °C according to UL 2367	
Storage temperature	-40 °C … +70 °C	
Mounting temperature	+5 °C … +60 °C	
Mounting type	Mounting rail according to EN 60715-35x7.5	
Mounting position	vertical	
Minimum distance to neighboring devices	horizontal 30 mm vertical 50 mm	
Humidity	96 h, 95 % RH, 40 °C	
Altitude	At 4,000 m up to 60 °C ambient temperature (operation)	
Degree of protection	IP20	
Flammability according to UL94	V-2	
Color	Dark grey: RAL7012	
Protection class	III	
Pollution degree	2	
Vibration resistance according to IEC/EN 60068-2-6	Test Fc: 2 g, 20 frequency cycles at 10 … 500 … 10 Hz	
Shock resistance according to IEC/EN 60068-2-27	15 G, 11 ms, 3 axes, 6 sides, 3x each side	
MTTF	25 °C: 2 068 776 h 40 °C: 1 244 772 h	25 °C: 999 324 h 40 °C: 604 854 h
Standards / electromagnetic compatibility		
Conformity	CE, RoHS, REACH, UKCA	
UL approval	UL 2367 recognized; E339236 UL 508 listed; E321314	
CSA approval	CSA C22.2 No. 14; E321314	
Maritime approval	Pending	
EMC requirements	Interference emissions: EN 61000-6-3 Interference immunity: EN 61000-6-2	
Dimensions		
Height	130 mm (133 mm incl. latching lever)	
Width	25 mm	
Depth	108 mm	
Weight	Approx. 175 g	Approx. 182 g
Power jumper for 24 V DC		
Number of contacts	2	
Pitch	15 mm	
Disassembly tools	Slotted screwdriver with a blade width of 5.5 mm, and flat-nose pliers	
Signal jumpers for 0 V, signal and reset		
Number of contacts	2	
Pitch	14 mm	
Disassembly tools	Slotted screwdriver with a blade width of 2.5 mm	

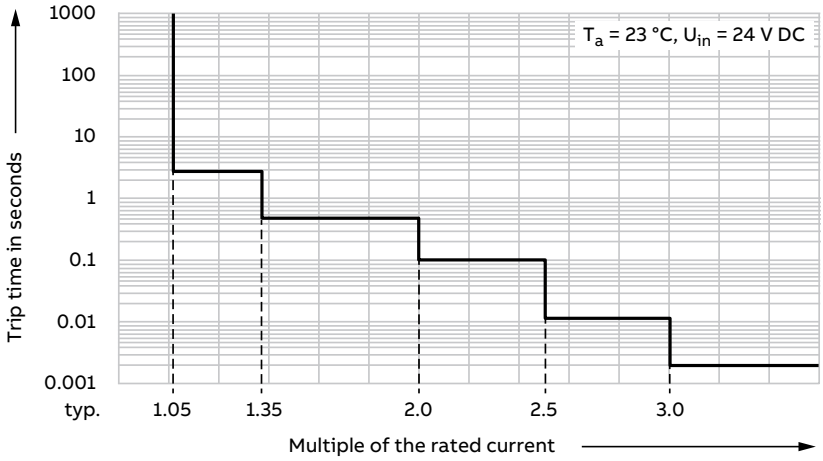
Electronic protection devices EPD24

Technical diagrams

TIME-CURRENT CHARACTERISTIC

Data for rated values Ta = 23 °C, Uin = 24 V DC, unless otherwise specified.

TRIP CHARACTERISTIC CURVE, ENTRY EPD24-E4 1-10 FOR TIME-CONTROLLED TRIPPING



Entry EPD24-E4 1-10	Trip characteristic curve, Entry EPD24-E4 1-10 for time-controlled tripping									
I_n	1 A	2 A	3 A	4 A	5 A	6 A	7 A	8 A	9 A	10 A
No tripping	< typ. 1.05 x I_n									
Tripping	> typ. 1.05 x I_n at t = 3 s > typ. 1.35 x I_n at t = 0,5 s > typ. 2.0 x I_n at t = 0,1 s > typ. 2.5 x I_n at t = 0,012 s > typ. 3 x I_n at t = 0,002 s									

- The channel output switches off as a function of the multiple of the rated current.

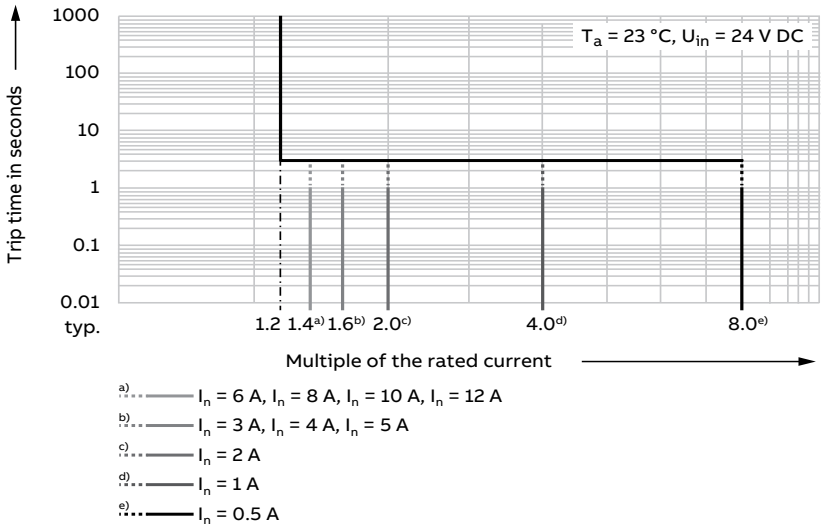
Electronic protection devices EPD24

Technical diagrams

TIME-CURRENT CHARACTERISTIC

- The higher the overcurrent when an overload or a short circuit occurs, the quicker the switch-off (LED for the channel output illuminates red).

Trip characteristic curve, Advanced EPD24-A4 0.5-12 with active current limiting



Advanced EPD24-A4 0.5-12							**Rated current can be set per channel output**			
I_n	0,5 A	1 A	2 A	3 A	4 A	5 A	6 A	8 A	10 A	12 A
No tripping	< typ. 1.2 x I_n									
Tripping during overload	typ. 1.2 x I_n bei t = 3 s									
Tripping during short circuit with active linear current limiting Typ. t = 0.01..1 s	typ. 8 x I_n	typ. 4 x I_n	typ. 2 x I_n	typ. 1.6 x I_n			typ. 1.4 x I_n			

- At an overload current of 1.2 x In, the tripping time is typ. 3 s.
- The active electronic current limiting is dependent on the rated current set. The tripping time is typ. between 10 ms and 1 s as a function of the multiple of the rated current or if there is a short circuit.
  - Current limiting typ. 8 x In at In = 0.5 A
  - Current limiting typ. 4 x In at In = 1 A
  - Current limiting typ. 2 x In at In = 2 A
  - Current limiting typ. 1.6 x In at In = 3 A to 5 A
  - Current limiting typ. 1.4 x In at In = 6 A to 12 A
- Without the activation of the current limiting, a considerably higher overload current would flow if an overload or short circuit occurred.

Electronic protection devices EPD24

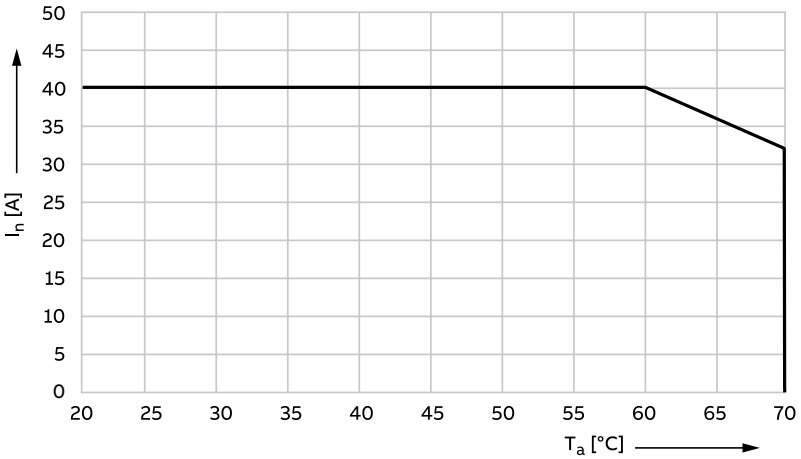
Technical diagrams

DERATING

Data for rated values Ta = 23 °C, Uin = 24 V DC relate to individual mounting, unless otherwise specified.

Temperature characteristic curve for the rated current I_a as a function of the ambient temperature T_a

ENTRY EPD24-E4 1-10

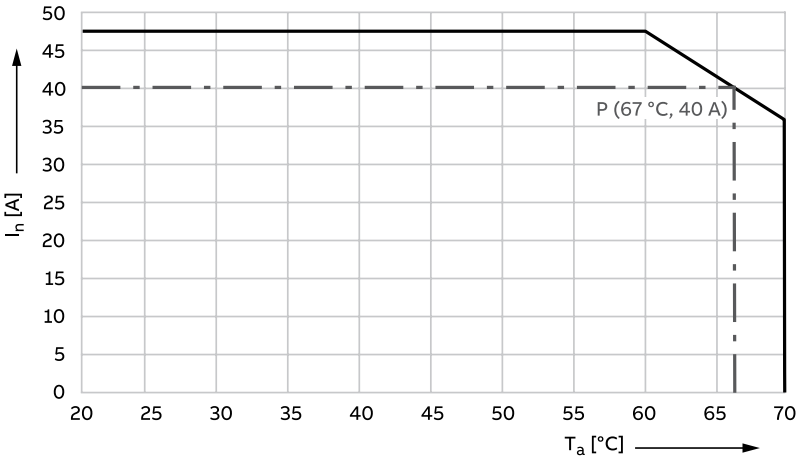


The electronic protection device Entry EPD24-E4 1-10 can supply the maximum rated current In at an ambient air temperature of

- ≤ 60 °C, max. rated current 40 A
- > 60 °C to ≤ 70 °C, the rated current reduces by the factor 2 %/K
- 70 °C, max. rated current 32 A

Temperature characteristic curve for the rated current I_a as a function of the ambient temperature T_a

ADVANCED EPD24-A4 0.5-12



The electronic protection device Advanced EPD24-A4 0.5-12 can supply the maximum rated current In at an ambient air temperature of

- ≤ 60 °C, max. rated current 48 A
- > 60 °C to ≤ 70 °C, the rated current reduces by the factor 2.5 %/K
- 70 °C, max. rated current 36 A

A rated current of 40 A is supplied by the electronic protection device Advanced EPD24-A4 0.5-12 at an ambient temperature of approximately 67 °C.

Electronic protection devices EPD24

Technical informations

MAXIMUM PERMISSIBLE CABLE LENGTH

The EPD24 safely trips from 0 Ω up to the max. circuit resistance R_{max}.

Calculation of R_{max} for Entry EPD24-E4 1-10										
Rated current I_n [A] (can be set per channel output)	1	2	3	4	5	6	7	8	9	10
Operating voltage U_B [V DC] (1) 80 % of rated current 24 V DC										19.2
Cut-off current I_{off} [A] 1.05 x I_n	1.05	2.1	3.15	4.2	5.25	6.3	7.35	8.4	9.45	10.5
$R_{max} = U_B / I_{off}$ (1)	18.3	9.1	6.1	4.6	3.7	3.0	2.6	2.3	2.0	1.8

Calculation of R_{max} for Advanced EPD24-A4 0.5-12										
Rated current I_n [A] (can be set per channel output)	0.5	1	2	3	4	5	6	8	10	12
Operating voltage U_B [V DC] (1) 80 % of rated current 24 V DC										19.2
Cut-off current I_{off} [A] 1.2 x I_n	0.60	1.2	2.4	3.6	4.8	6	7.2	9.6	12	14.4
$R_{max} = U_B / I_{off}$ (1)	32.0	16.0	8.0	5.3	4.0	3.2	2.7	2.0	1.6	1.3

(1) The voltage drop or internal resistance of the EPD24 and the tolerance of the cut-off point are already taken into account.

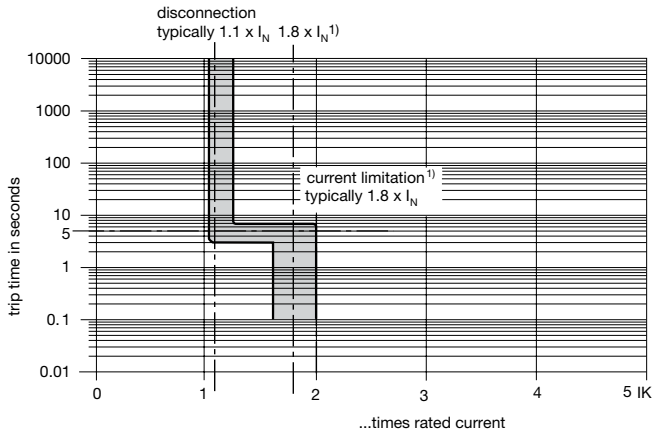
Table for selecting supply line lengths for different cable cross sections							
Cable cross section A [mm²]	0.14	0.25	0.34	0.5	0.75	1	1.5
Distance L [m] (= basic length)	Total cable resistance R_L [Ω] $R_L = \frac{\rho_0 \cdot 2L}{A}$ Specific electrical resistance of copper ρ_0 = 0.0178 (Ω mm²)/m						
5	1.27	0.71	0.52	0.36	0.24	0.18	0.12
10	2.54	1.42	1.05	0.71	0.47	0.36	0.24
15	3.81	2.14	1.57	1.07	0.71	0.53	0.36
20	5.09	2.85	2.09	1.42	0.95	0.71	0.47
25	6.36	3.56	2.62	1.78	1.19	0.89	0.59
30	7.63	4.27	3.14	2.14	1.42	1.07	0.71
35	8.90	4.98	3.66	2.49	1.66	1.25	0.83
40	10.17	5.70	4.19	2.85	1.90	1.42	0.95
45	11.44	6.41	4.71	3.20	2.14	1.60	1.07
50	12.71	7.12	5.24	3.56	2.37	1.78	1.19
75	19.07	10.68	7.85	5.34	3.56	2.67	1.78
100	25.43	14.24	10.47	7.12	4.75	3.56	2.37
125	31.79	17.80	13.09	8.90	5.93	4.45	2.97
150	38.14	21.36	15.71	10.68	7.12	5.34	3.56
175	44.50	24.92	18.32	12.46	8.31	6.23	4.15
200	50.86	28.48	20.94	14.24	9.49	7.12	4.75
225	57.21	32.04	23.56	16.02	10.68	8.01	5.34
250	63.57	35.60	26.18	17.80	11.87	8.90	5.93

The cable impedance determines the max. trip current for 24 V DC applications: L = 50 m; A = 1.5 mm²

$I = U / R_L = 24\ V\ DC / 1.19\ \Omega = 20.2\ A$

Electronic protection devices EPD24
Technical diagrams

TIME/CURRENT CHARACTERISTIC CURVE

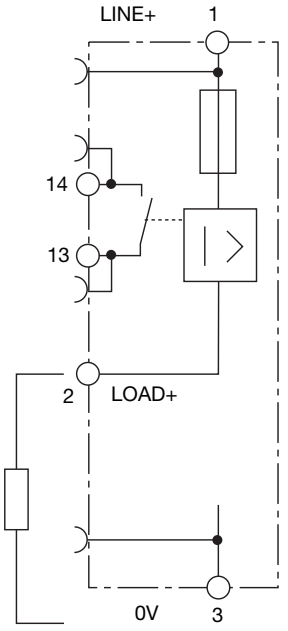


1) Current limitation typically 1.8 x I_N at I_N = 0.5 A...6 A
Current limitation typically 1.5 x I_N at I_N = 8 A or 10 A
Current limitation typically 1.3 x I_N at I_N = 12 A

WIRING DIAGRAM

EPD24-TB-101
without signal input
with signal output F
(Single signal, N/O)

Operating condition: 13-14 closed
Fault condition: 13-14 open



Electronic protection devices EPD24

Approvals, Safety instructions

Please note

The user must ensure that the cable cross sections of the relevant load circuit are suitable for the current rating of the EPD24 used. Automatic start-up of machinery after shut down must be prevented (Machinery Directive 2006/42/EU and IEC/EN 60204-1). In the event of a short circuit or overload the load circuit will be disconnected electronically by the EPD24.

Information on UL approvals/CSA approvals

UL1604
UL File # E 339238

CSA C22.2 No. 213 (Class I, Division 2)
CSA File # 2305929

Operating Temperature Code T5

- This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only

WARNING:

Exposure to some chemicals may degrade the sealing properties of materials used in the following devices.

- Relay Sealant Material:
  - Generic Name: Modified diglycidyl ether of bisphenol A
  - Supplier: Fine Polymers Corporation
  - Type: Epi Fine 4616L-160PK

- Casing Material:
  - Generic Name: Liquid Crystal Polymer
  - Supplier: Sumitomo Chemical
  - Type: E4008, E4009, or E6008

RECOMMENDATION:

- Periodically inspect the device named above for any degradation of properties and replace if degradation is found

WARNING – EXPLOSION HAZARD:

- Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous
- Substitution of any components may impair suitability for Class I, Division 2

UL2367
Non-hazardous use - UL File # E 339236

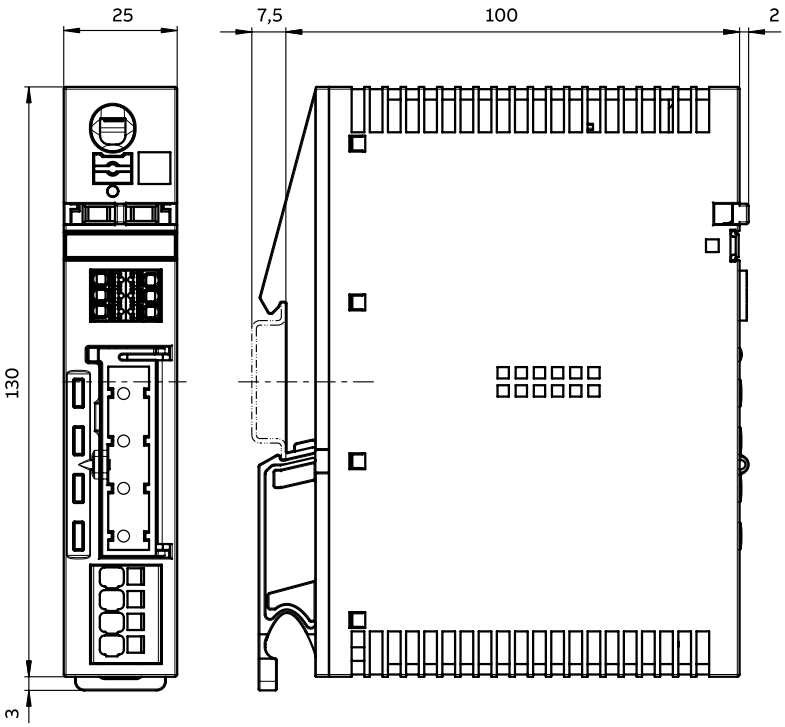
UL 508
Non-hazardous use - UL File # E 149922

CSA C22.2 No. 14
CSA C22.2 No. 142 - CSA File # E 2305929

Class 2
Meets requirement for Class 2 current limitation (EPD24 ... -0.5 A/1 A/2 A/3 A)

Electronic protection devices EPD24

Dimensions



Dimensions in mm

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CP-C.1 24/5.0-L	1SVR361563R1001	18
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You can find the address of your local sales organization on the ABB homepage

abb.com/lowvoltage

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